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RIDGEFIELD BRICK AND TILE

RIDGEFIELD, WASHINGTON

FINAL OPERATION AND MAINTENANCE INSPECTION REPORT

WA 6906
~~WA 2411~~

Prepared For

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Waste Program Enforcement
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TABLE OF CONTENTS

TABLE

FIGURE

EXECUTIVE SUMMARY

PRC Environmental Management, Inc. (PRC) assessed all of the monitoring wells and the toe drain at the Ridgefield Brick and Tile (RBT) site and determined that the aboveground construction of the monitoring wells was adequate for the collection of representative groundwater samples. However, the sampling procedures used by the facility, the maintenance of the monitoring wells, and the field sampling plan were generally inadequate to ensure the collection of representative groundwater samples.

PRC notes the following deficiencies regarding groundwater and toe drain sampling procedures: absence of gloves during sample collection, inaccurate water-level measurements, inadequate decontamination procedures, lack of environmental parameter collection during purging, and inadequate containment of purge water.

The maintenance of the groundwater monitoring system is inadequate for the collection of representative samples. Turbidity of the groundwater samples was relatively high (25-340 NTU) indicating potentially inadequate well development. This high turbidity may affect analytical results.

The sampling and analysis plan used by the facility is inadequate in that it provides little or no details regarding sampling schedules, sample collection procedures, decontamination methods, analytical methods and quality assurance/quality control procedures. Data reported by the facility was inadequate in that sample numbers were not cross referenced to existing well locations.

Facility analytical results for this round of split groundwater sampling show no phenols, polynuclear aromatic hydrocarbons (PAHs), arsenic, or chromium present in concentrations above the method reporting limit of the facility laboratory. Results from U.S. Environmental Protection Agency (EPA) split groundwater samples collected during this round of sampling show the presence of a number of volatile organic compounds, phenols, and PAHs in concentrations below the method reporting limit of the facility laboratory, indicating the possibility for groundwater contamination to exist and not be detected by the facility's analytical program. Arsenic and chromium were detected at maximum concentrations of 2.4 μg/L and 15.6 μg/L, respectively, in unfiltered EPA groundwater and leachate split samples. It is possible that the detected arsenic, chromium, and PAHs are related to the particulate fraction suspended in the groundwater and leachate samples.

Hydrogeologic site characterization remains incomplete. Because observed water-level measurements were inaccurate and the monitoring wells are dry for much of the year,

groundwater flow directions have not been adequately demonstrated for the perched groundwater zone. The requirement for one upgradient and three downgradient wells stipulated in 40 CFR 265.91 (a)(1) and 40 CFR 265.91 (a)(2) is not met because groundwater flow directions have not been adequately demonstrated. The perched groundwater zone is only seasonally saturated and can be used for detection of releases from the RBT landfill only when there is sufficient water for the collection of representative groundwater samples. Because the monitoring wells seasonally contain little or no water, monitoring the existing wells on a quarterly basis will not adequately detect potential releases from the landfill. One alternative would be to install a monitoring well system in the uppermost aquifer (the regional Troutdale aquifer) as required by 40 CFR 265.90 (a).

Another alternative would be to sample the landfill toedrain and underdrain system sumps in addition to the existing monitoring well system. An underdrain system located beneath the liner of the landfill liner has recently been described. EPA has expressed concern that leachate from the landfill may not be transported far enough horizontally to reach the monitoring wells. The underdrain sump could be sampled to provide analytical data for perched groundwater beneath the landfill. In addition, data collected during this O & M inspection suggest that groundwater collected from monitoring wells screened in the perched groundwater zone is in contact with the contents of landfill; several of the wells show low levels of contaminants.

During dry periods when there not enough water in the perched groundwater zone to monitor, there is also less water passing through the landfill. Consequently, there is less of a chance for a significant release. During the wet season when the maximum quantity of water is passing through the landfill, the wells, toe drain sump, and underdrain sump could be sampled in order to detect significant releases from the RBT landfill. A rigorous monitoring program should be developed to determine when sufficient water is present in the wells, toe drain, or underdrain system for the collection of samples. Under this monitoring program, it is very important to obtain water quality samples for the initial pulse of water passing through the waste at the beginning of the wet season. This water will likely have the highest concentration of contaminants. One sampling round should be scheduled to coincide with this initial fall flush. Two more sampling rounds should be performed during the wet season when there is sufficient water for sampling (November through March). A fourth round should be attempted after a significant storm event during the dryer part of the year (May through August). If significant concentrations of contaminants are detected in the monitoring wells or the underdrain sump during these rounds of sampling, the facility should install monitoring wells screened in the regional aquifer (Troutdale Formation).

1.0 INTRODUCTION

PRC Environmental Management, Inc. (PRC) received work assignment no. 12R10047 from the U.S. Environmental Protection Agency (EPA) to conduct an operation and maintenance (O&M) inspection at the Ridgefield Brick and Tile (RBT) landfill in Ridgefield, Washington. At the request of EPA, PRC performed the O&M inspection to evaluate how facility personnel operate and maintain the groundwater monitoring system in terms of pertinent Resource Conservation and Recovery Act (RCRA) regulations and permit requirements. This report describes the O&M inspection conducted on March 27 - March 28, 1991 at the RBT site.

The specific objectives of the RBT O&M inspection were as follows:

- Evaluate the compliance of the groundwater monitoring system with the consent agreement and final order (EPA 1986a), RCRA interim status groundwater monitoring regulations (40 CFR 265 Subpart F), and protocols specified by EPA (1986b)
- Determine whether sampling devices are in working order and are properly maintained
- Evaluate the facility sampling and analysis plan
- Determine whether individual monitoring wells yield representative groundwater data
- Evaluate groundwater contamination from analytical results of split groundwater samples received by PRC
- Evaluate the analytical program of the facility through the comparison of facility and split sample analytical results

PRC personnel present on-site were geologists Ben Farrell and Gary Bruno. Technical points were discussed with Bryant Adams of Pacific Wood Treating Corporation (PWT) and Mike Buren of David J. Newton Associates, a consultant to PWT.

2.0 SETTING AND SITE HISTORY

The RBT site is an inactive landfill located in a rural area at 3510 N.W. 289th street in Ridgefield, Washington. PWT owns the 5.5-acre landfill and also owns and operates an active wood-treating facility in nearby Ridgefield. The PWT wood-treating facility uses pentachlorophenol, creosote, and a chrome-copper-arsenic solution as preservatives (Tetra Tech 1989). In 1979, PWT began to use the RBT landfill for the disposal of log-deck waste, yard

cleanup waste, and boiler ash. Between 1979 and January 1983, PWT disposed of approximately 7,600 yd^3 of waste (EPA 1986a) in the RBT landfill. Of this amount, 2,500 yd^3 consisted of boiler ash (Hazard Management Specialists 1987 in Tetra Tech 1989). An estimated 5 yd^3 (5,000 lb) of the boiler ash result from wastewater sludge incineration (Tetra Tech 1989).

Wastewater sludge generated from the wood-treating activities is designated as a K001 (creosote/pentachlorophenol wastewater treatment sludge) and D004 (arsenic) hazardous waste. As specified in 40 CFR 261.3 (b)(2) and 40 CFR 261.3 (c)(2)(i), all ash derived from the incineration of the sludge and all solid waste (boiler ash) mixed with a K001-listed waste will retain the K001 hazardous waste listing.

During an EPA inspection of the PWT wood treating facility in Ridgefield, Washington, it was discovered that RCRA-listed and regulated K001/D004 waste was being disposed of in the unregulated RBT landfill (Tetra Tech 1989). PWT subsequently submitted a RCRA Part A permit application for the RBT landfill on May 25, 1983 and gained interim status. A closure plan for the RBT landfill was submitted to the Washington Department of Ecology (Ecology), and closure activities were conducted during September 1983 under Ecology supervision (Tetra Tech 1989). A wedge-shaped landfill cell equipped with a drain system was constructed as part of this closure effort. All wastes were transferred into the cell in compacted 18-inch lifts and covered with a compacted clay cap (Tetra Tech 1989).

As a result of the deficiencies in the original closure plan and closure activities, EPA issued a consent agreement and final order to PWT in November 1986. This order stated that PWT would submit a closure plan within 3 months pursuant to 40 CFR 265 subpart G, addressing the installation of a groundwater monitoring system in compliance with 40 CFR 265 subpart F capable of providing hydrogeological information to satisfy the requirements of 40 CFR 270.14 (c). As required by the order, PWT submitted a revised closure plan in February 1987. The plan was determined deficient by EPA because it did not address the hydrogeologic characterization requirements of 40 CFR 270.14 (c), the requirements of 40 CFR 265.90 (a) regarding groundwater monitoring of the uppermost aquifer, and the requirements of 40 CFR 265.92 and 40 CFR 265.93 pertaining to the selection of appropriate analytical parameters for groundwater monitoring.

Clean closure is being considered by the facility in an effort to avoid postclosure requirements. Clean closure may be possible for RBT through a removal action (EPA 1990b). Alternately, clean closure may be possible through a detailed demonstration that all components of the landfill are not contaminated above health-based criteria and do not exhibit any of the characteristics of hazardous waste (EPA 1990b). The facility submitted a delisting petition in an

effort to delist the contents of the landfill in 1987. This petition had not been approved and a revised closure plan had not been received at the time of the inspection. A monitoring well system was installed in August 1988.

3.0 SITE GEOLOGY AND HYDROGEOLOGY

There are two potential aquifers of concern underlying the RBT site. The upper perched water zone occurs in a series of Quaternary sands, silts, and clays. Lithologic logs from borings at the RBT site show that the Quaternary alluvial deposits occur as three distinct lithologic units. From top to bottom these include: a 10- to 25-foot thick clayey silt unit, a silty micaceous sand unit, and a basal clean sand unit. The silty micaceous sand and clean sand units appear to pinch out to the west of the landfill and thicken to the east, reaching a maximum combined thickness of approximately 20 feet. The quaternary alluvial deposits are underlain by weathered gravel deposits of the Troutdale Formation. Seasonal perched water exists in the sand and silt units that rest upon the Troutdale Formation.

The direction of groundwater flow within the perched zone is reported to be toward the northwest at the RBT site (DNA 1990). At the southern portion of the landfill, the direction of groundwater flow may be to the southeast (DNA 1990). See Appendix B for potentiometric surface maps of the RBT site. As discussed in Section 5.2, poor procedures for water-level measurement observed during this inspection and the frequent historical absence of water in the wells cast doubt on the validity of the potentiometric surface maps.

The deeper regional aquifer occurs in silts and sands of the Tertiary Troutdale Formation. Depth-to-water in the Troutdale Formation is approximately 180 feet below ground surface (bgs). The direction of groundwater flow within the Troutdale aquifer is generally toward the northwest in the general vicinity of the RBT site (Tetra Tech 1989).

4.0 GROUNDWATER MONITORING SYSTEM

The RBT groundwater monitoring system consists of seven wells (B-1 through B-7). Monitoring well locations are shown in Figure 1. Monitoring well B-5 is the facility designated upgradient well, while all of the other wells are either cross-gradient or downgradient of the landfill. As discussed in Section 5.2, the accuracy of these designations is questionable. Monitoring wells B-2, B-3, and B-4 are screened in clayey silts and the Troutdale gravels beyond the westward limit of the sand facies (DNA 1988). All of the other wells are screened across the

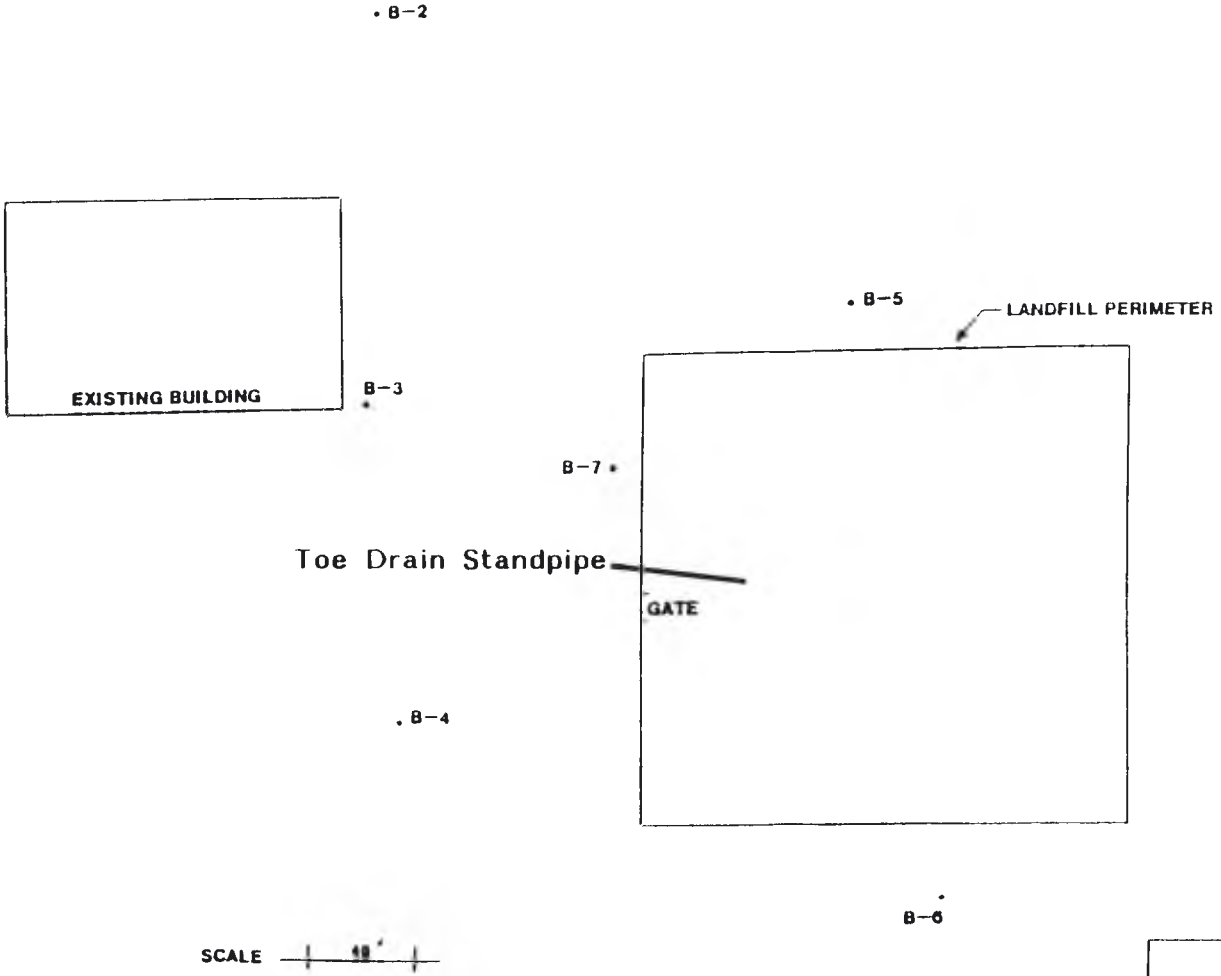

Figure 1

RBT Well Location Map

Adapted from Tetra Tech (1989)

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contact between the sand layers and the Troutdale Formation gravels (DNA 1988). The monitoring wells often become dry in the spring, summer, and fall.

5.0 SITE INSPECTION

On March 27-28, 1991, PRC conducted the O&M inspection at RBT. On March 27, 1991, the weather was generally sunny and temperatures ranged between 55 and 65°F. On March 28, 1991, the weather was rainy and temperatures ranged between 45 and 55°F. PRC personnel observed water-level measurements at all of the monitoring wells. Split groundwater samples were received by PRC personnel from monitoring wells B-4, B-5, and B-6. Water accumulating in the stand pipe to the toe drain of the landfill was also split-sampled. A photographic log of the site visit is presented in Appendix A. Potentiometric surface maps, PRC field notes, the O&M inspection checklist, RBT analytical data, EPA analytical data, and well construction diagrams are presented in Appendices B through G, respectively.

5.1 WELL MAINTENANCE AND ABOVEGROUND WELL CONSTRUCTION

The aboveground portion of the monitoring wells appeared to be adequately maintained. The wells were constructed with lockable protective outer casings that were securely locked. The protective outer casings were set into small circular concrete bases that appeared to fit tightly against protective outer casings. Each well was equipped with an inner well cap. None of the inspected wells were labelled. The outer casings of all the monitoring wells were quite rusted, and the monitoring wells did not have protective posts to shield the wells from collision.

5.2 WATER-LEVEL MEASUREMENTS

Water-levels were measured both before and after purging to determine if there was sufficient groundwater for sample collection. Depth-to-water was measured using an electronic probe and a separate stainless steel measuring tape. Measurements were taken from the edge of the outer protective casing. The stainless steel tape was not decontaminated prior to use, and the facility representative stated that it had also been used at the PWT wood-treating plant. At the request of PRC, the well probe was decontaminated by rinsing the probe tip and attached tape with deionized water. After the water-level was measured at monitoring well B-6, a large number of unidentified larvae were found on the well probe.

The well probe had been cut and respliced so that a given measured distance had to be corrected to account for the shortening of the well probe. The stainless steel measuring tape was

commonly used in the correction process. Based on observed measuring practices, the water-level measurements were not accurate to within .01 foot, as recommended by EPA (1986b).

Examination of the water-level data used for the construction of potentiometric surface maps raises further questions concerning the quality of the data. Water-level measurements recorded large differences over short time periods. For example, between January 12, 1990 and January 15, 1990 (the two dates used to create the potentiometric maps shown in Appendix B), the water-level in monitoring well B-1 reportedly dropped 26.4 feet (DNA 1990). Fluctuations of this magnitude also have been reported for monitoring well B-4 over time spans of approximately 1 week (DNA 1990). It is likely that errors were made by the facility during water-level measurements, because such rapid water-level fluctuations cannot be explained hydrogeologically.

An examination of the potentiometric surface map for January 12, 1990 (Appendix B) reveals that water-levels for monitoring wells B-2, B-3, and B-7 were below the top of the Troutdale Formation. It is unclear whether the measured water-levels in these wells represent the potentiometric surface for the perched zone, since the water-levels occur in screened intervals situated below the top of Troutdale Formation.

5.3 WELL PURGING AND ENVIRONMENTAL PARAMETERS

Well purging and sampling was accomplished using a top-emptying teflon bailer. EPA (1986b) states that a bottom-emptying bailer is more appropriate for the collection of volatile organic compounds than a top-emptying bailer. The bailer was lowered slowly into the wells using a synthetic measuring tape. Due to low water-levels and slow recharge rate in monitoring wells B-4 and B-5, these two wells were purged to dryness on the day prior to sampling to allow sufficient recovery time. Monitoring wells B-1, B-2, and B-7 also did not contain enough water for purging and groundwater sampling during the site inspection.

PRC personnel observed groundwater purging at monitoring well B-6 on March 27, 1991. At monitoring well B-6, three casing volumes were purged from the well. Purge water was poured directly onto the ground surface. No environmental parameters such as conductivity, pH, temperature, or turbidity were collected during well purging. Groundwater from the monitoring wells was quite turbid, resulting in sample collection problems described in Section 5.4. The groundwater turbidity increased during purging. Leachate purged from the landfill toe drain was significantly less turbid than the groundwater. The leachate sample collected from the standpipe inlet was nearly clear.

5.4 SAMPLE COLLECTION

After well purging, groundwater samples were collected by the facility contractor. Split groundwater and leachate samples received by PRC were analyzed for the following parameters by the EPA Manchester Laboratory:

- Volatile organic compounds (modified SW-846 method 8260 [EPA 1986c])
- Polynuclear aromatic hydrocarbons (PAH) and chlorophenols (special analytical services method gas chromatograph/mass spectrometer, selected ion monitoring mode)
- Total arsenic and chromium (EPA methods 206.2 and 218.2, respectively [EPA 1983])
- Total arsenic and chromium (field-filtered using same analytical methods specified above)

The PRC Quality Assurance Project Plan (QAPjP) (PRC 1991) specified monitoring wells B-3, B-4, B-5, and B-6 for groundwater sampling. Monitoring well B-3 was not sampled due to lack of water in the well. The PRC QAPjP also specified that triple sample volumes would be collected for matrix spike/matrix spike duplicate (MS/MSD) analysis at monitoring well B-5. Because of low water-levels in monitoring well B-5, the MS/MSD sample volumes were collected at monitoring well B-4. Due to the relatively low water-level in monitoring well B-4, double sample volumes were collected in lieu of triple sample volumes. This reduction of sample volume did not affect sample results. No samples were collected for arsenic and chromium analysis at monitoring well B-5 due to the low water-level.

PWT personnel submitted groundwater and leachate samples for the following analyses:

- PAHs (SW-846 methods 3510/8100 [EPA 1986c])
- Chlorinated phenolic compounds (SW-846 methods 3510/modified 8150 [EPA 1986c])
- Total organic carbon (EPA method 415.1 [EPA 1983])
- Total arsenic and chromium (filtered) (SW-846 methods 7060 and 6010, respectively [EPA 1986c])
- Chloride, fluoride, nitrate, sulfate (EPA method 300 [EPA 1984])
- Turbidity (EPA method 180.1 [EPA 1983])
- pH and conductivity (EPA methods 150.1 and 120.1, respectively [EPA 1983])

The facility did not collect groundwater or leachate samples for volatile organic analyses.

Samples were generally collected in decreasing order of volatility. An exception to this trend occurred at monitoring well B-4, where metal samples were collected first. The rationale for collecting the metal sample first was that the groundwater appeared to become more turbid with successive bailing. Filtered metal samples proved to be very difficult to collect because the turbid groundwater samples clogged the filter apparatus. Facility personnel tried two different techniques for field-filtering the samples intended for metals analysis (see photographs 6 and 11). Because these methods were ineffective, the facility decided to not preserve the field-filtered metals samples and have the laboratory filter the samples. PRC personnel were able to filter all of their split samples to be analyzed for metals using Nalgene™ hand filters.

Monitoring well B-4 was sampled first because it contained the most water. Sampling next commenced at monitoring well B-5. However, due to insufficient groundwater in monitoring well B-5, the sampling crew decided to sample B-6 and then return to B-5 after the well had time to recharge. Monitoring well B-6 also had insufficient groundwater for the completion of split sampling. The sampling crew decided to finish sampling at B-5 and then return to B-6. After the completion of groundwater sampling at B-5, the sampling crew took water-level measurements at B-6. Because there was still insufficient water in this well, the sampling crew decided to return the next day (March 27, 1991) to complete groundwater sampling at this well. Monitoring well B-3, which is one of the wells specified for sampling in the PRC QAPjP (PRC 1991), was not sampled because sufficient sample volume could not be obtained in a reasonable time period.

After sampling, the PWT sample containers were placed in coolers with a small amount of ice. The facility groundwater split samples were hand-delivered to Columbia Analytical Services in Kelso, Washington on March 28, 1991.

Leachate split samples were collected from the vertical standpipe at the toe drain of the landfill on March 27, 1991. The 8-foot long, 3-foot diameter, vertical standpipe is set approximately 6 feet bgs. The standpipe provides access to the landfill drainage system, which drains to a large storage container located at the southern portion of the property. The bailer was rinsed with deionized water prior to purging. The first split sample, designated TD-1 by PRC, was collected with the same bailer used for groundwater sample collection from standing water that had collected in the toe drain. An EPA duplicate sample designated TD-10 was also collected from the standing water in the toe drain. After collection of the first sample, RBT

personnel purged the standpipe. RBT personnel then climbed into the standpipe with a ladder and collected a leachate split sample (TD-2) directly from the standpipe inlet.

6.0 FACILITY ANALYTICAL DATA

The facility analytical results for the split sampling event are not complete. According to the chain-of-custody sheet, a total of six samples was submitted for chemical analysis. The samples are numbered, but are not cross referenced to existing well locations. The collection of rinsate blanks and field (transfer) blanks by the facility sampling team was not observed by PRC personnel. Based on the facility chain-of-custody sheet, sample 28, which is one of the toe drain samples based on the date of collection, was not analyzed. Sample 25 was analyzed for organic parameters, but not for inorganic parameters. No rationale was provided by the facility for omitting these samples from analysis.

The facility analytical results show no PAHs, phenols, arsenic, or chromium above the method reporting limit of the facility laboratory. The turbidity values for all of the groundwater samples are high (25-340 NTU). The maximum recommended level for turbidity is 5 NTU measured on consecutive days (EPA 1990a). Concentrations of nitrate, chloride, fluoride, and sulfate are below state and federal primary and secondary groundwater quality criteria as established by the Washington Administrative Code (WAC 173-200-040) and EPA (1990a). It should be noted that the state and federal primary groundwater criteria specify the concentration of nitrate measured as nitrogen, while the facility measured nitrate as nitrate only. The pH values fall within the 6.5 to 8.5 range specified in state and federal secondary groundwater quality criteria.

7.0 EPA ANALYTICAL DATA

Complete results for the split groundwater and leachate samples received by PRC are shown in Appendix F. A summary of compounds detected in groundwater and leachate samples during the O&M inspection is shown in Table 1. In an effort to meet quality assurance/quality control objectives, PRC submitted a trip blank, an equipment rinsate blank for both the groundwater monitoring system and the toe drain system, an environmental duplicate for both the groundwater and toe drain systems, and a MS/MSD sample for chemical analysis. Data were validated by the EPA Manchester Laboratory using the guidelines established by EPA (1988a,b).

Table 1

Detected Compounds (µg/L)

Inorganic Compounds	RB-B4-01	RB-B10-01 (duplicate of B4)	RB-B5-01	RB-B6-01	RB-TD1-01	RB-TD2-01	RB-TD10-01 (duplicate of TD-1)
Total Arsenic	1.8J	2.4J	Not Sampled	1.9J	---	---	---
Filtered Arsenic	---	---	Not Sampled	1.9J	---	---	---
Total Chromium	15.6J	14.5	Not Sampled	1.7B	1.1B	1.9	1.4B
Filtered Chromium	1.3B	1.1B	Not Sampled	.7JB	.4JB	.9JB	.3JB
Volatiles Organic Compounds							
1,2-Dichloroethane	.8J	.2J	.5J	---	1.4	.4J	.4J
Chloromethane	---	.05J	.1J	---	---	---	---
Carbon disulfide	---	.2J	---	---	---	---	---
Chloroform	---	---	.1J	---	---	---	---
Chloroethane	---	---	---	---	1J	---	.1J
1,1-Dichloroethane	---	---	---	---	.2J	---	---
Semivolatile Organic Compounds							
Benzo(a)pyrene	.03J	.03J	.04J	.05J	---	---	---
Acenaphthene	.0006J	.0006J	.001J	.002J	.6J	.2J	.6J
Phenanthrene	.005J	.007J	.02J	.01J	.1J	.05J	.1J
Carbazole	.02J	---	---	---	.2J	.05J	.1J
Pentachlorophenol	.02J	.02J	.06J	.06J	1J	.7J	1J
4-Methylphenol	.0003J	---	---	---	.01J	.02J	.006J
Phenol	---	---	---	.9J	---	---	---
2-Methylphenol	---	---	---	---	.005J	.002J	.002J
2-Methylnapthalene	.002J	.003J	.005J	.004J	.02J	.004J	.01J
Naphthalene	---	---	---	---	.4J	.2J	.4J
1-Methylnapthalene	---	.003J	.005J	.005J	.1J	.05J	.1J
Pyrene	.02J	.01J	.02J	.02J	.08J	.02J	.09J
Dibenzofuran	.001J	---	---	.002J	.2J	.06J	.2J
Benzo(b)fluoranthene	.04J	.03J	.06J	.04J	---	---	---
Fluoranthene	.01J	.008J	.02J	.01J	.08J	.03J	.08J
Benzo(k)fluoranthene	.03J	.03J	.03J	.02J	---	---	---
Anthracene	---	---	---	---	.04J	.02J	.04J
Dibenzo(a,h)anthracene	---	.02J	---	---	---	---	
Acenaphthylene	---	---	---	---	.02J	.007J	.01J
Fluorene	---	---	.002J	---	.2J	.1J	.2J
Benzo(g,h,i)perylene	---	---	---	.02J	---	---	---

--- Indicates that compound was not detected above instrument detection limit/method detection limit (U) or that the analyte was not detected at or above the reported result (UJ).

J Analyte was detected above the instrument/method detection limit but not quantified with expected limits of precision. Estimated concentration.

B Analyte also found in analytical method blank, indicates possible sample contamination.

Inorganic compound analysis reveals the presence of arsenic and chromium in both filtered and unfiltered groundwater and leachate samples from the RBT site. Maximum concentrations of arsenic (2.4 μg/L) and chromium (15.6 μg/L) were detected in a groundwater sample and duplicate groundwater sample from monitoring well B-4. The maximum value for arsenic is above the .05-μg/L state of Washington primary groundwater standard (WAC 173-200-040) established for this carcinogenic compound, but below the 50-μg/L concentration established in the national interim primary drinking water standards (EPA 1990a). RBT chromium concentrations are below state and federal primary drinking water standards (WAC 173-200-040, EPA 1990a). Total arsenic and chromium concentrations are generally higher than the results for the field-filtered samples, indicating that the greatest concentrations of chromium and arsenic are in the suspended sediment fraction of the turbid groundwater samples. Chromium was detected in the method blanks. Therefore, all chromium results within 10 times the detection limit are qualified B (Appendix F). Due to a low water-level in the designated upgradient monitoring well B-5, no sample was collected at this well for arsenic and chromium analysis.

Results for PAH and phenol analysis also show the presence of several compounds. These compounds are all estimated at concentrations of less than or equal to 1 μg/L and are qualified J (Appendix F). The results from the toe drain samples show excellent correlation. The toe drain samples have exactly the same semivolatile organic compounds present. Pentachlorophenol was detected at a maximum estimated concentration of 1 μg/L in two samples collected from the toe drain. The following compounds were detected in all of the monitoring wells, but not in the toe drain leachate split samples: benzo(a)pyrene, benzo(b)fluoranthene, and benzo(k)fluoranthene. The concentrations of benzo(a)pyrene, benzo(b)fluoranthene, and benzo(k)fluoranthene all closely approach or exceed 10^{-6} cancer risk-based concentrations established by EPA (1991b).

Groundwater samples collected during this O&M inspection were quite turbid. The high degree of turbidity of groundwater samples collected in the facility monitoring wells is problematic in that high turbidity can adversely affect chemical analysis for any compound that has a tendency to adsorb onto sedimentary particles. Samples analyzed for arsenic and chromium were filtered to alleviate this problem. However, for some of the more insoluble PAH compounds, it is difficult to determine whether the detected contamination in the monitoring wells is related to the groundwater fraction or to the suspended sediment fraction.

Results for volatile organic compounds show very low concentrations of a few compounds, which are estimated at concentrations above the instrument detection limit and are designated J (Appendix F). Of these, 1,2-dichloroethane occurs in both toe-drain samples and in

all of the monitoring wells samples with the exception of monitoring well B-6. This compound was also found at the maximum concentration for any of the volatile organic compounds detected at the RBT site, 1.4 μg/L for the TD-1 sample, but below the 5 μg/L maximum contaminant level established for this compound (EPA 1990a). Chloromethane was detected in monitoring wells B-4 and B-5 in concentrations of less than 1 μg/L. All of the other detected compounds occurred in very low concentrations in a single monitoring well or toe drain sample.

Low levels of vinyl chloride, trichlorofluoromethane, 1,2-dichloroethane, toluene, carbazole, benzo(b)fluoranthene, fluoranthene, benzo(k)fluoranthene were detected in one or both equipment rinsate blanks. All of the above compounds were detected in concentrations of less than 1 μg/L and were estimated J (Appendix F). Low levels of chloroform and dibromochloromethane were detected in the ambient condition blank, and chloroform was detected in the trip blank. The low levels of chloroform detected in the groundwater and leachate samples are probably the result of contamination during shipping or ambient contamination.

The presence of 1,2-dichloroethane, carbazole, benzo(b)fluoranthene, fluoranthene, and benzo(k)fluoranthene in the equipment rinsate blanks is problematic since these compounds also were detected in either groundwater or leachate samples. It is probable that the presence of these compounds in groundwater and leachate samples is related to poor equipment decontamination procedures since the compounds were not found in the laboratory blanks.

The detection of low levels of volatile organic compounds, PAHs, and phenols in the EPA split groundwater samples shows the potential for groundwater contamination to occur that would not be detected by the analytical program of the facility. The detection of arsenic and chromium at levels above the facility method reporting limit for nonfiltered EPA split groundwater samples shows the potential contamination associated with the sediment fraction suspended in the groundwater and the need for the facility to collect nonfiltered metals samples as well as filtered metals samples.

8.0 HISTORICAL ANALYTICAL DATA

Data collected by the facility between 1983 and 1986 show concentrations of naphthalene and pentachlorophenol at less than or equal to 10 μg/L for on-site lysimeters, toe drain, and local wells (Hazard Management Specialists 1987). Arsenic and chromium were detected in concentrations below the federal primary drinking water standards, which are 50 and 100 μg/L, respectively. Data from a 1989 comprehensive groundwater monitoring evaluation (CME) show

PAH concentrations typically below 1 μg/L for leachate samples collected from the toe drain (Tetra Tech 1989). Naphthalene was detected at concentrations of 1.5 μg/L and 1.8 μg/L for toe-drain samples. A maximum pentachlorophenol concentration of .73 μg/L was reported from the toe drain during the CME sampling event. No groundwater samples were collected during the 1989 CME because of lack of water in the wells. The split samples collected by PRC confirm the presence of low concentrations of arsenic, chromium, volatile organic compounds, phenols, and PAHs in groundwater and leachate samples at the RBT site.

9.0 GROUNDWATER SITE CHARACTERIZATION

Groundwater characterization at the site remains incomplete. PWT's groundwater monitoring system is designed to monitor the shallow silt and sand aquifer, which is adequate to detect releases from the landfill only if there is enough water in the perched zone to monitor. The wells at RBT are dry for a significant portion of the year. For example, during September 1987 to May 1988, only one of the seven monitoring wells contained enough water for measurement during frequent measuring events (DNA 1990). During January to July 1990, at least one of the seven monitoring wells was dry during frequent water-level measurements (DNA 1990).

The seasonal dryness of the wells poses a problem from the well development standpoint. When wells are dry for substantial periods, fine-grained sediment may be flushed into the packing and through the well screen when water reenters during recharge events. Most of the wells are screened either in silt or across the silt/Troutdale gravel contact. The fine grain-size and lithologic variability within the screened interval can make well development difficult (EPA 1991a).

As discussed in Section 5.2, observed water-level measurements were not accurate to within .01 foot, as specified by EPA (1986b), and may be inaccurate by tens of feet. Also since most of the monitoring wells are dry for much of the year, groundwater flow directions cannot be adequately demonstrated for the perched groundwater zone. The requirement for one upgradient and three downgradient wells stipulated in 40 CFR 265.91(a)(1) and 40 CFR 265.91(a)(2) has not been met since groundwater flow directions have not been adequately delineated.

Because the monitoring wells seasonally contain little or no water, simply monitoring the existing wells on a quarterly basis will not adequately detect potential releases from the landfill.

One alternative would be to install a monitoring well system in the uppermost aquifer (the regional Troutdale aquifer) as required by 40 CFR 265.90 (a).

Another alternative would be to sample the landfill toedrain and underdrain system sumps in addition to the existing monitoring well system. An underdrain system located beneath the liner of the landfill has recently been described (DNA 1992). The underdrain consists of two perforated PVC pipes beneath the landfill liner that extend from the northeast and southeast corners of the landfill and join in the center of the west landfill boundary (DNA 1992). From the center of the west landfill boundary, a non-perforated PVC pipe carries water to a sump. The underdrain system was constructed to prevent liner damage caused by a seasonal rise in the perched zone (DNA 1992). EPA has expressed concern that leachate from the landfill may not be transported far enough horizontally to reach the monitoring wells (DNA 1992). The underdrain system could be sampled to provide analytical data for perched groundwater beneath the landfill. In addition, data collected during this O & M inspection suggest that groundwater collected from monitoring wells screened in the perched groundwater zone is in contact with the contents of landfill; several of the wells show low levels of contaminants.

During dry periods when there not enough water in the perched groundwater zone to monitor, there is also less water passing through the landfill. Consequently, there is less of a chance for a significant release. During the wet season when the maximum quantity of water is passing through the landfill, the wells, toe drain, and underdrain could be sampled in order to detect significant releases from the RBT landfill. A rigorous monitoring program should be developed to determine when sufficient water is present in the wells, toe drain, or underdrain system for the collection of samples. Under this monitoring program, it is very important to obtain water quality samples for the initial pulse of water passing through the waste at the beginning of the wet season. This water will likely have the highest concentration of contaminants. One sampling round should be scheduled to coincide with this initial fall flush. Two more sampling rounds should be performed during the wet season when there is sufficient water for sampling (November through March). A fourth round should be attempted after a significant storm event during the dryer part of the year (May through August). If significant concentrations of contaminants are detected in the monitoring wells or the underdrain sump during these rounds of sampling, the facility should install monitoring wells screened in the regional aquifer (Troutdale Formation).

10.0 SUMMARY

PRC assessed all of the monitoring wells at the RBT site and determined that the aboveground construction of the monitoring wells was adequate for the collection of

representative groundwater samples. However, the sampling procedures used by the facility, the maintenance of the monitoring wells, and the field sampling plan were generally inadequate to ensure the collection of representative groundwater samples.

The following deficiencies regarding groundwater and toe-drain sampling procedures were observed during the RBT O&M inspection:

- Sampling gloves were not worn by facility personnel during sample collection.
- Water-level measurements were not accurate to within .01 foot, as specified by EPA (1986b), because of measuring errors introduced through use of the spliced well probe and the metal tape.
- Metal tape often used to measure water-levels in the well was not decontaminated before or between use at monitoring wells. This tape was used in the Pacific Wood Treating shop prior to sampling.
- Equipment decontamination procedures were inadequate when practiced at all. Facility personnel were not equipped with necessary items for proper decontamination (Alconox wash, distilled water rinse, deionized water rinse). Only at the request of PRC was a deionized or distilled water rinse performed on sampling equipment.
- Conductivity, pH, and temperature were not measured during purging as specified by EPA (1986b).
- Purge water was discharged directly to the ground surface. This practice may spread potential contaminants present in the groundwater.

The maintenance of the groundwater monitoring system is inadequate for the collection of representative samples. Turbidity of the groundwater samples was relatively high (25-340 NTU). This high turbidity may affect analytical results. Unfortunately, the fine-grained lithology of the screened interval makes further well development impractical or impossible.

The sampling and analysis plan used by the facility at the time of the PRC O&M inspection is the same one viewed during the CME (Tetra Tech 1989). As noted in the CME report, the plan is inadequate in that it provides little or no detail regarding sampling schedules, sample collection procedures, decontamination methods, analytical methods, and quality assurance/quality control procedures. Data reported by the facility were inadequate in that sample numbers were not cross referenced to existing well locations.

Facility analytical results for this round of split groundwater sampling show no volatile organic compounds, phenols, PAHs, arsenic, or chromium present in concentrations above the method reporting limit of the facility laboratory. Results from EPA split groundwater samples

show the presence of a number of volatile organic compounds, phenols, and PAHs in concentrations below the method reporting limit of the facility laboratory, indicating the possibility that groundwater contamination exists and may not be detected by the facility's analytical program. Arsenic and chromium were detected at maximum concentrations of 2.4 µg/L and 15.6 µg/L, respectively, in unfiltered EPA groundwater and leachate split samples. It is possible that the PAH, arsenic, and chromium are related to the suspended sediment present in the turbid groundwater and leachate samples

Groundwater flow directions have not been adequately demonstrated for the perched groundwater zone. Also, the perched groundwater zone is only seasonally saturated and can be used for detection of releases from the RBT landfill only when there is sufficient water for the collection of representative groundwater samples. Because the monitoring wells seasonally contain little or no water, merely monitoring the existing wells on a quarterly basis will not adequately detect releases from the RBT landfill.

11.0 RECOMMENDATIONS

PRC recommends the following regarding observed sampling practices:

- Clean sampling gloves should be worn by facility personnel at each well during sampling.
- The spliced electronic water-level measurement device should not be used. Static water-levels for each well should be measured using appropriate equipment and should be accurate to within .01 foot as specified by EPA (1986b).
- The metal tape used for water-level measurements should not be used without proper decontamination.
- Proper decontamination procedures should be practiced by the facility in accordance with EPA (1986b).
- In accordance with EPA (1986b), temperature, pH, and specific conductance should be measured in the field during well purging. Groundwater sampling should not commence until these parameters have stabilized.
- The facility should consider containing purged groundwater until chemical testing is complete.

PRC recommends that the field sampling plan used by the facility be rewritten to provide adequate procedures and techniques as specified by EPA (1986b) for sample collection, preservation, and shipment; sample analysis; and chain-of-custody control. The facility should cross reference sample numbers with well locations. Because of the presence of arsenic and

chromium in concentrations above the method reporting limit, the facility should collect both filtered and unfiltered metals samples.

Because the monitoring wells usually contain little or no water, monitoring the existing wells on a quarterly basis will not adequately detect potential releases from the landfill. One alternative would be to install a monitoring well system in the uppermost aquifer (the regional Troutdale aquifer) as required by 40 CFR 265.90 (a). Another alternative would be to sample the wells, toe drain sump, and underdrain system sump, when there is available water. A rigorous monitoring program should be developed to monitor wells and sumps to determine when there is sufficient water present for the collection of water quality samples. Under this monitoring program, it is very important to obtain water quality samples for the initial pulse of water passing through the waste at the beginning of the wet season. This water is most likely to have the highest concentration of contaminants. One sampling round should be scheduled to coincide with this initial fall flush. Two more sampling rounds should be performed during the wet season when there is sufficient water for sampling (November through March). A fourth round should be attempted after a significant storm event during the dryer part of the year (May through August). If significant concentrations of contaminants are detected in the monitoring wells or the underdrain sump during these rounds of sampling, the facility should install monitoring wells screened in the regional aquifer (Troutdale Formation).

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APPENDIX A PHOTOGRAPHIC LOG

Photo No. 1

Date: March 27, 1991

Personnel: Bryant Adams
Mike Buren

Direction Facing: West

Picture Description: Unlocking monitoring well B-3.

Photo No. 2

Date: March 27, 1991

Personnel: Bryant Adams

Direction Facing: Northwest

Picture Description: Monitoring well B-7.

Photo No. 3

Date: March 27, 1991

Personnel: Bryant Adams

Direction Facing: Northwest

Picture Description: Measuring water level at monitoring well B-4. A potentially contaminated steel tape used at the PWT shop was used for initial water level measurements at this well.

Photo No. 4

Date: March 27, 1991

Personnel: Mike Buren

Direction Facing: Southwest

Picture Description: Purging monitoring well B-4. Purged groundwater was dumped directly onto the ground surface.

Photo No. 5

Date: March 27, 1991 Personnel: Bryant Adams, Mike Buren Direction Facing: Southwest

Picture Description: Sampling for total metals at monitoring well B-4. Note the high degree of turbidity in the groundwater sample.

Photo No 6

Date: March 27, 1991 Personnel: Bryant Adams, Mike Buren Direction Facing: Southwest

Picture Description: Field-filtering for dissolved metals at monitoring well B-4. The filter clogged frequently rendering this technique ineffective. Bryant Adams refused to wear gloves during sampling.

Photo No. 7

Date: March 27, 1991

Personnel: Bryant Adams

Direction Facing: Northwest

Picture Description: Monitoring well B-6.

Photo No. 8

Date: March 27, 1991 Personnel: Bryant Adams, Mike Buren Direction Facing: West

Picture Description: Decontaminating bailer at monitoring well B-6.

Photo No 9

Date: March 27, 1991 Personnel: Bryant Adams, Mike Buren Direction Facing: East

Picture Description: Decontaminating bailer at monitoring well B-5. Decontamination water was poured directly on the ground surface.

Photo No 10

Date: March 27, 1991

Personnel: Bryant Adams

Direction Facing: West

Picture Description: Decontaminating water-level measuring device at monitoring well B-1.

Photo No 11

Date: March 27, 1991 Personnel: N/A Direction Facing: N/A

Picture Description: Showing apparatus used to filter groundwater samples for metals analysis. The unit included a funnel, an inline filter, and a cut plastic container used to support the filter system. This system clogged frequently and was eventually abandoned.

Photo No. 12

Date: March 28, 1991 Personnel: Bryant Adams, Mike Buren Direction Facing: Northeast

Picture Description: Purging toe drain standpipe. Discharge was not containerized.

Photo No. 13

Date: March 28, 1991 Personnel: Bryant Adams, Mike Buren Direction Facing: Northwest

Picture Description: Sampling the toe drain standpipe.

Photo No 14

Date: March 28, 1991

Personnel: N/A

Direction Facing: N/A

Picture Description: Collecting standing water sample TD-1 from the toe drain standpipe.

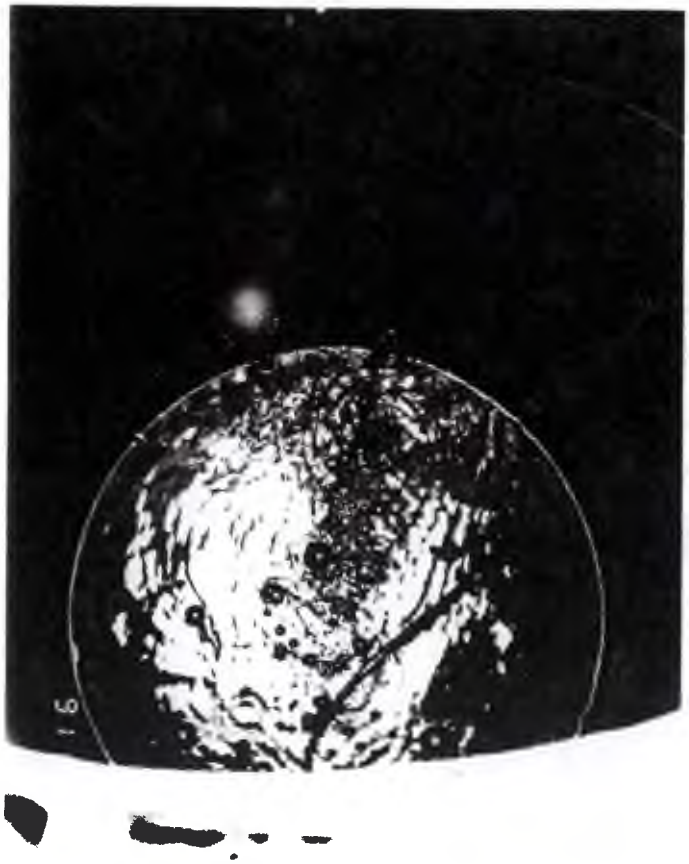


Photo No. 15

Date: March 28, 1991

Personnel: N/A

Direction Facing: N/A

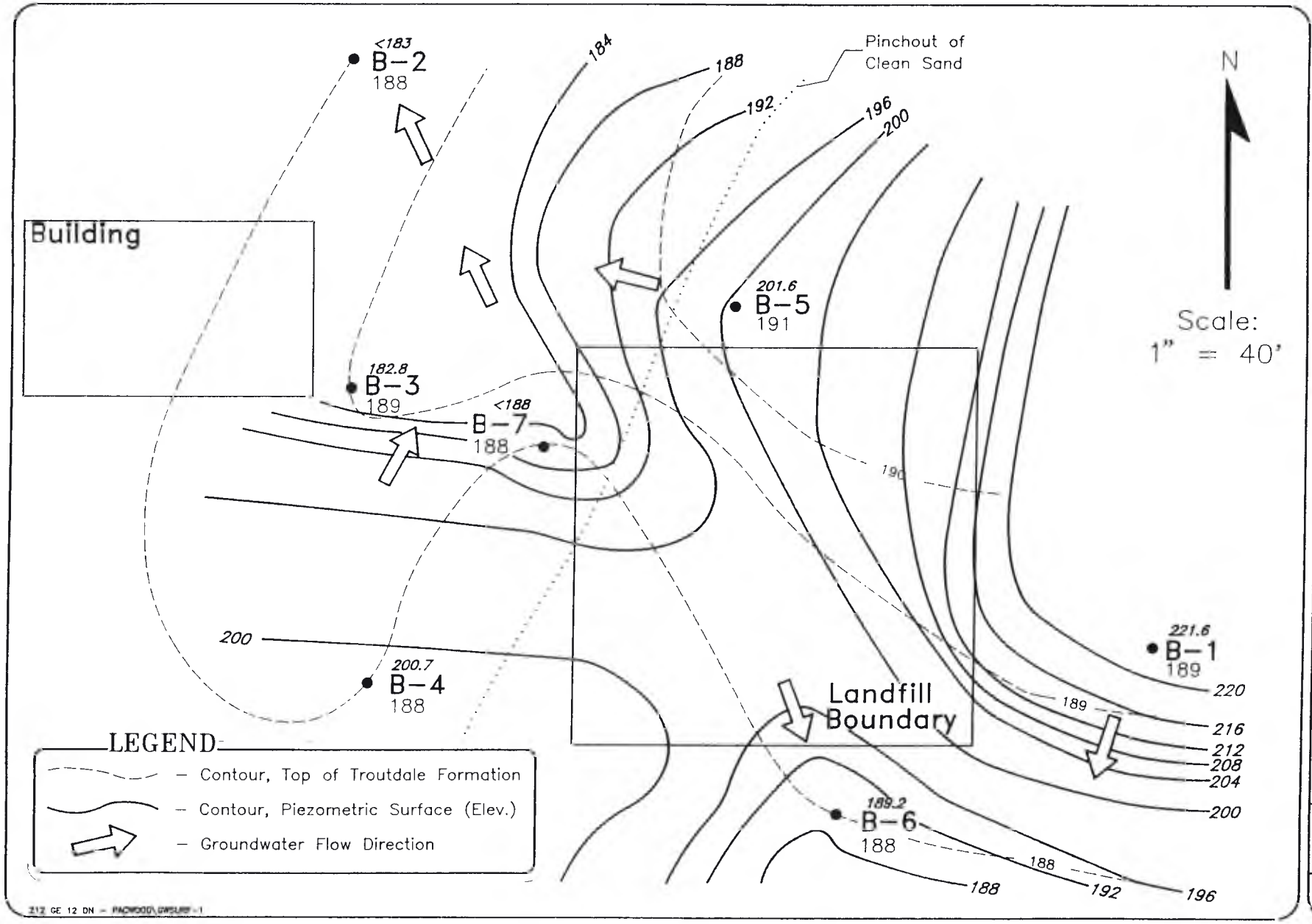
Picture Description: Showing inlet of the toe drain, sample location TD-2.

Photo No. 16

Date: March 28, 1991 Personnel: N/A Direction Facing: Southeast

Picture Description: Showing the RBT landfill. The landfill boundary is delineated by a fence.

APPENDIX B POTENTIOMETRIC SURFACE MAPS



212 GE 12 DN – PACWOOD\GWSURF-1

FIGURE

1

DAVID J. NEWTON ASSOC. INCORPORATED
CIVIL & GEOLOGICAL ENGINEERING
1201 S.W. 12TH AVE., SUITE 630
PORTLAND, ORE. 97205 • 228-7718 • FAX 228-7761
BRANCH 767 WILLAMETTE ST., SUITE 306
EUGENE, ORE. 97401 • 344-0855 • FAX 344-1827

PIEZOMETRIC SURFACE Jan 12, 1990

DATE

JULY 1990

PROJECT NO.

212 GE 12 DN

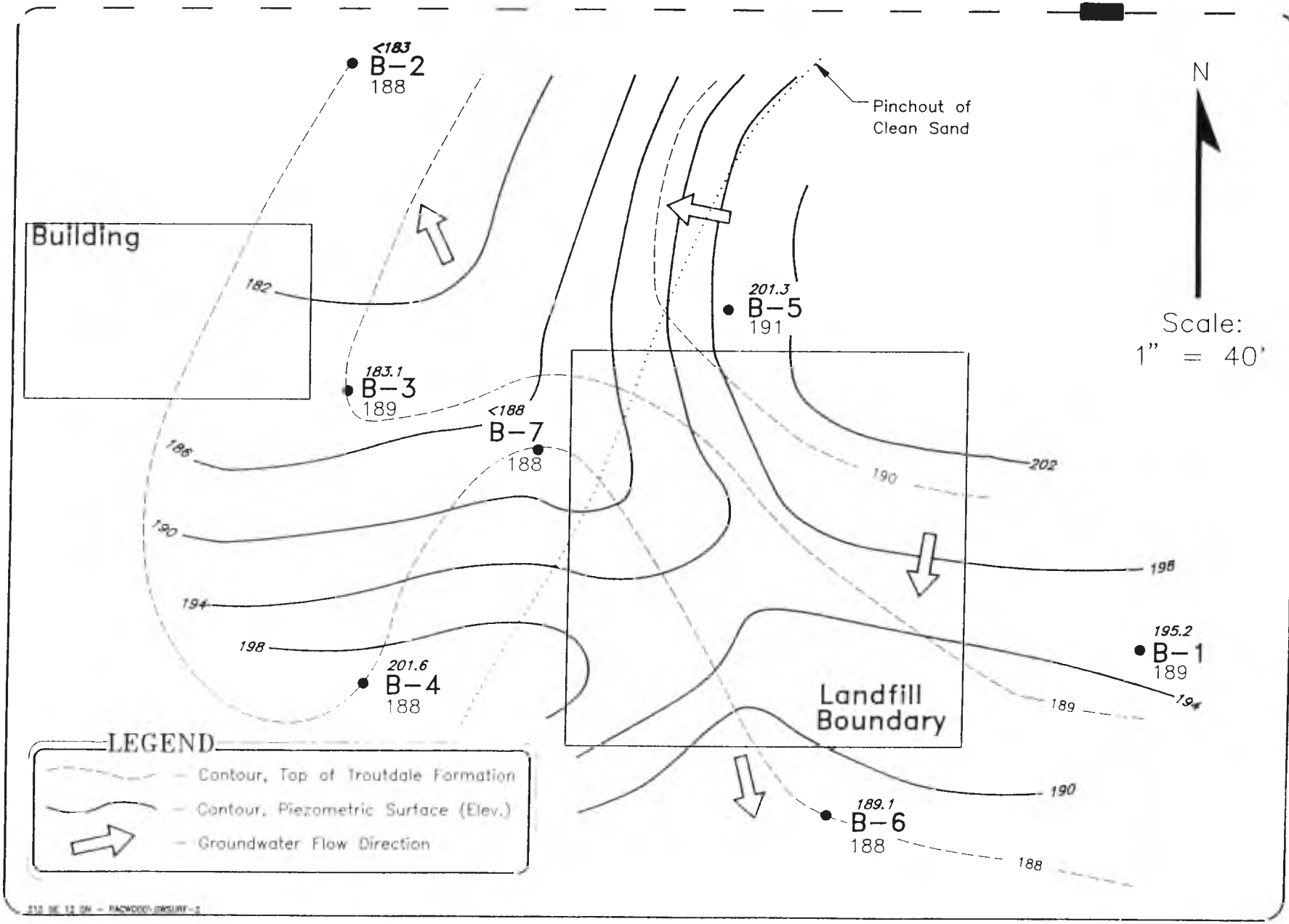


FIGURE 2

DAVID J. NEWTON ASSOC. INCORPORATED
CIVIL & GEOLOGICAL ENGINEERING
1201 S.W. 12TH AVE., SUITE 620
PORTLAND, ORE. 97205 • 228-7718 • FAX 228-7781
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EUGENE, ORE. 97401 • 344-0955 • FAX 344-1827

PIEZOMETRIC SURFACE Jan 15, 1990

DATE
JULY 1990

PROJECT NO.
212 GE 12 DN

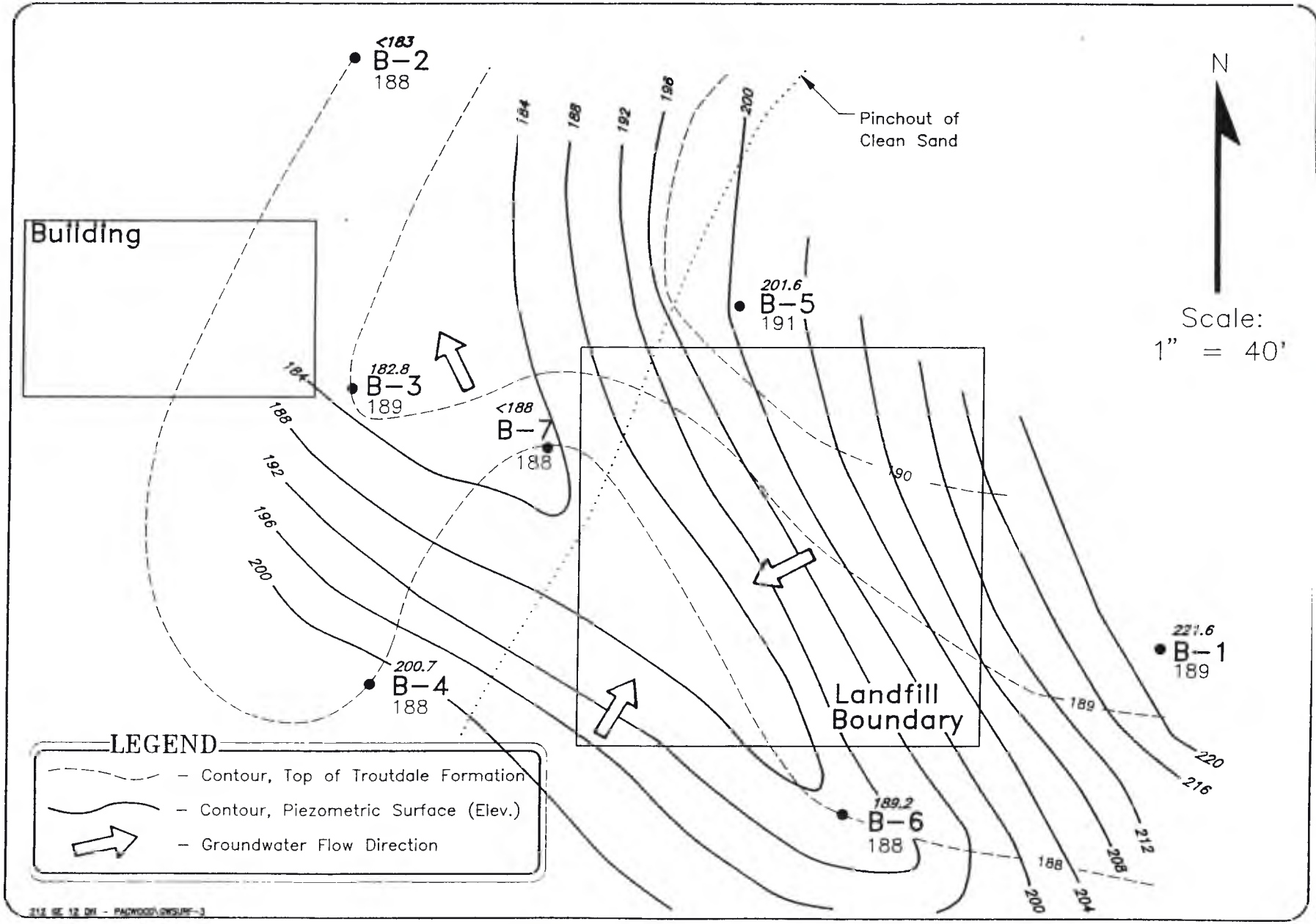

FIGURE 3

DAVID J. NEWTON ASSOC. INCORPORATED
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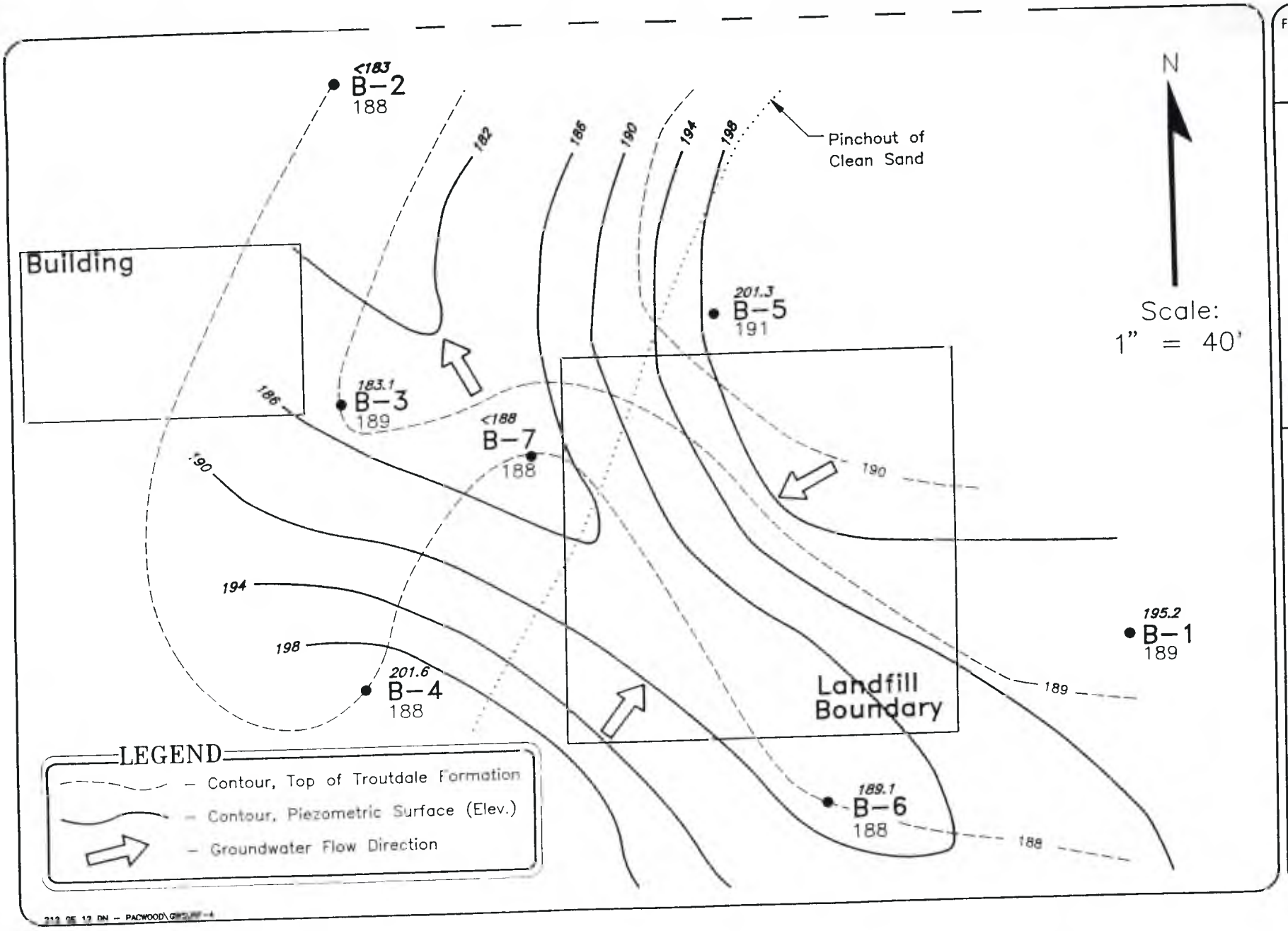
PIEZOMETRIC SURFACE Jan 12, 1990

DATE
JULY 1990

PROJECT NO.
212 GE 12 DN



F

4

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PIEZOMETRIC SURFACE Jan 15, 1990

DATE
JULY 1990

PROJECT NO.
212 GE 12 DN

212 GE 12 DN – PACWOOD\GFIGURE-4

APPENDIX C PRC FIELD NOTES

Ridgefield
Brick and Tile

Ridgefield,
Washington

Operator and
Maintenance
Inspector

March 27 and 28,
1991

3/27/91 Bryant on site
8:50 AM.

Bryant Adams
Pacific Wood Treating
Corp.
Ridgefield

Mike Buran
David Newton Assoc.

#24 Well B-2

#23 Well B-3
#22 Well B-3
water level measurement
.69 feet deep.

Bryant Adams
measured well B-3
on 3/26, too low
to purge and
sample.

2 4 and 5
purged yesterday
3/26 using trailer.

#21 Well B-4 opening
20 decontaminating
probe using D-I
water.

measured 1, using
steel tape on

4.12 ft to WL

rinsed steel tape
d/s with D-I water.

LUFKIN Tape.

#18 Well B-6
17 Well B-6 w/c
measurement

34.68 feet deep w/c.

#16 Well B-1 . (time 10:18)
decontaminating
probe by
rinsing with
D-I water
deep well. - only 2-3 inches
(.7 feet)
on 3/26 the well B-6
had 3 ft water

#15-14-13 scenic of
landfill

#12 Well B-5

on 3/26 32 ft. water.

3/27 3 ft water.

#11 Well B-7 (10:36)
usually only has
1 inch water
historically

about 4 inches .34 feet.

some kind of larva
on probe. after
removing from well

RBT's parameters
PAH
Chlorophenols
Arsenic
Chromium.

1115 PRC took equipment
rinsate sample
& blanks.

Bottle was discontinued
in the PAT lab
[illegible]

RB-B15-01

11:50 .45 micron filter
quickfilter
high capacity
(QED - FF-4200
environmental systems)
clogged out mouth

over filter tube to suck
water through
Ben F.
unknown filter element
appropriate? Yes

water cloudy with particulate
makeshift 'stand'
not used for anything else

11:? begin collecting
filtered metals
samples

ground work very
cloudy.

RBT attempted to
collect filtered
metals samples
using in line filter
and funnel. Did
not work.

PRC used Nalgene filtering equipment.

decided to collect filtered metals first due to turbidity as water is withdrawn from well.

collect total metals next RB-B4-01

RB-B4-01 MS/MSD

RB-B10-01 duplicate of well B-4.

due to concern for enough ground water available from YSI well B-4 for all samples MS/MSD duplicate, PRC decided to collect only 3 1-L containers for each sample type.

Sample RB-B4-01	3	1-L
MS "	3	1-L
MSD "	3	1-L
duplicate of B4 RB-B10-01	3	1-L

2/4/97 collecting 9 1-L containers for PAH. RBT took its sample for TOC and specific cond, pH, fluoride, chloride, sulfate

Nitrate, turbidity.

— Last 3 chlorophenol/PAH taken after B10 samples about 1245.

#5 } well B-5
#4

order: VOA
PAH 1 liter
chlorophenol 1 liter

1145 RBT took lunch break

1215 Purged 3 volumes from well B-6. will let recover and return after lunch.

Alternated samples with RBT.

(on top of ball) Sand - very turbid caused bailer to malfunction

1515 moved to well B6 to ask to let B5 recover

300 pm. move to well B-5.

Services
Columbia Analytical ~~Lab~~
PO Box 479 Kelso WA 98626

#3 well B-6

1520 took VOA RB-B6-01
PAH 1 L

RBT took PAH 1 L

ground-water clear.
PRC Chlorophenol ½ L

1600 moved back to well
B5 to at
B-6 recover
- rinsed trailer with blank water
- RBT finished its collection of penta-Chlorophenol 1 L samples.

water very turbid with silt in trailer

after a few trailers well dry.

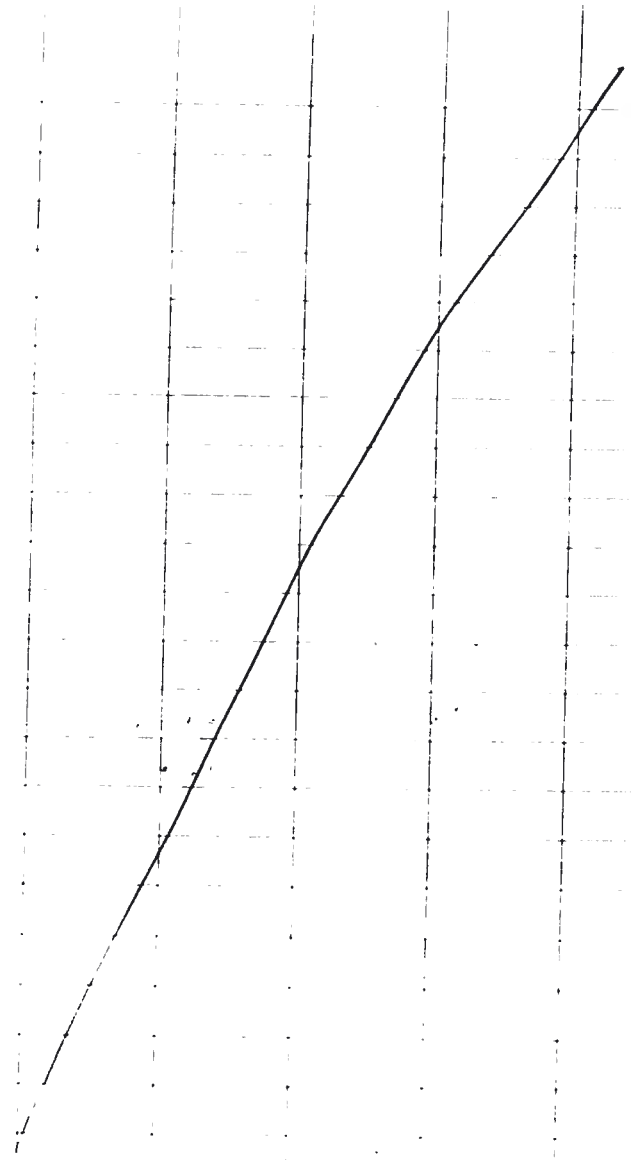
Note on grounds around landfill area. Ground vegetated but swampy on all sides of landfill but east upgradient (up hill) side

1610 move back to well B6.

rinsed trailer with blank water

Water marker
Water level Indicator
Johnson Division VOP

1715:40 Curious bystander
Disorganized samples — different samples, mixed with trash, lunch, bags etc.



3/28/91

0745 Arrived on AST site met Bryant Adams

mobilized to Toe Drain to begin sampling

Weather overcast and sprinkling.

8:25 Facility samples

Jumbled not stored properly cooled overnight with minimal ice

0930 moved to well 8-6 to continue sampling

39.66 feet today to water so about 2½ ft water.

RBT rinsed bailer with D-I water and line before starting.

Mike of David Newton Assoc. wears gloves.

non-indelible on labels

930 (2) PRC collected total metals and dissolved metals samples RB-B6-01

(1) RBT collected 1-L sample for pentachlorophenol

(3) RBT collected metals sample.

~~Are plastic bottles OK?~~ BF.

RBT collects
(4) metals sample for dissolved metals using inline filter rigged with funnels.

RBT collects TOC sample

900 PRC collects PAH sample to continue previous day's sample.

930 moved to TOC drain

RBT used bailer to collect standing leachate.

Rinsed bailer with D-I water before starting.

PRC collected

RB-TD1-01
6 VOC
12 PAH 1-L
12 Chlorophenols 1-L
2 Total metals
2 Dissolved metals

1015 RB-TD10-01
4 PAH 1-L
4 Chlorophenol 1-L
2 metals
1 total
1 dissolved

1030 begin TDC drain purge

inlet pipe gushing water very hard with TDC drain

PRC collected
4 PAH 1-L
4 Chlorophenol 1-L
1 Total Metal
1 Dissolved Metal
2 VOH vials

RBT collected
PAH - TOC
Penta - pH, SC
Total metal
Dissolved metals - filtered in lab.
finish TDC drain

1110 place toe drain cover back in place.

PRC is samples from inlet pipe in toe drain were collected by RBT who went down ladder with drain.

VOA samples were collected from the fast moving inlet stream by carefully holding vial at edge of stream. Collected with no headspace or bubbles.

All other PRC samples also collected from inlet stream. by RBT.

1125 collected VOA equipment rinsate RB-TD15-01 9113 0168

PH/+
Chloroform
Total Metals
Dissolved Metals

1200 PRC collected field transfer blank by pouring HPLC water into preserved VOA vials (HCl)

1215 left site

requested detail information from RBT.

APPENDIX D OPERATION AND MAINTENANCE FIELD INSPECTION CHECKLIST

4. Observe the owner/operator's staff as they collect ground-water samples at several wells. Complete the following table for each well (Note: revise or add to the table if permit conditions dictate a different requirement the owner/operator must follow):

Position/Title	Name	Sampling Experience (years and type)
Geologist	Mike Buran	< 1 yr. environmental
Environmental Manager	Bryant Adams	17 yr. environmental

Well Identification Number B-4	Y/N	Photograph Taken Y/N
Did the sampling crew measure static water levels in the well and well depths prior to the sampling event?	Y	Y
Did the sampling crew use a steel tape or electronic device totake depth measurements?	Y	Y
Did the sampling crew record depths to +/– 0.01 feet?	N	Y
Did the sampling crew follow these procedures: 1. remove locking and protective cap; 2. sample the air in the well head for organic vapors; 3. determine the static water level; and 4. lower an interface probe into the well to detect immiscible layers.	N	N
If immiscible samples were collected, were they collected prior to well purging?	NA	—
Did the sampling crew evacuate low yielding wells to dryness prior to sampling?	Y	—
Did sampling crew evacuate high yielding wells so that at least three casing volumes were removed?	Y	Y
Did the sampling crew collect the purge water for storage and analysis or for shipment off-site to a RCRA treatment facility?	N	N
Were sampling devices constructed of fluorocarbon resins or stainless steel?	FR	Y

NA = not applicable

(Continued)

Well Identification Number B-4	Y/N	Photograph Taken Y/N
If the sampling crew used dedicated samplers, did they disassemble and thoroughly clean the devices between samples?	NA	
If samples are collected for organic analyses, did the cleaning procedure include the following steps: 1. non phosphate detergent wash 2. tap water rinse 3. distilled/deionized water rinse 4. acetone rinse 5. pesticide-grade hexane rinse?	N	Y
If samples are collected for inorganic analyses, does the cleaning procedure include the following steps: 1. dilute acid rinse (HNO_3 or HCL) 2. distilled/de-ionized water rinse?	N	N
Did the sampling crew take trip blanks, field blanks and equipment blanks?	N	N
If the sampling crew used bailers, were they bottom valve bailers?	N	Y
If the sampling crew used bailers, was "teflon" coated wire, single strand stainless steel wire or monofilament used to raise and lower the bailer?	N	Y
If the sampling crew used bailers, did they lower the bailer slowly to the well?	Y	N
If the sampling crew used bailers, were the bailer contents transferred to the sample container to minimize agitation and aeration?	Y	Y
Did the sampling crew take care to avoid placing clean sampling equipment, hoses, and lines on the ground or other contaminated surfaces prior to insertion in the well?	N	Y
If the sampling crew used dedicated bladder pumps: Was the compressed gas from an oilless compressor certified quality commercial compressed gas cylinder? If not, was a suitable oil removal purification system installed and maintained?	NA	
Was the bladder pump controller capable of throttling the bladder pump discharge flow to 100 ml/min or less for continuous periods of at least 20-30 seconds without restricting liquid discharge?	NA	

(Continued)

Well Identification Number B-4	Y/N	Photograph Taken Y/N
Were samples taken from the bladder pump discharge tube, and not from any purge device discharge tube?	NA	
Was the bladder pump discharge flow checked for the presence of gas bubbles before each sample collection, as a test for bladder integrity?	NA	
Was bladder pump flow performance monitored regularly for dropoff in flow rate and discharge volume per cycle?	NA	
Was the bladder pump incorporated in a combination sample-purge pump design which can expose the bladder pump interior and discharge tubing to the pump drive gs? If so, were operating procedures established and followed to prevent at all times the entry of drive gas into the sample flow or into the bladder pump interior?	NA	
Did the sampling crew collect and containerize samples in the order of the volatilization sensitivity of the parameters?	BF N	N
Did the sampling crew measure the following parameters in the field: pH, temperature, specific conductane?	BF N	N
Did the sampling crew sample background wells before sampling downgradient wells?	N	—
Did the sampling crew use fluorocarbon resin or polyethylene containers with polypropylene caps for samples requiring metals analysis?	BF Y	Y
Did the sampling crew use glass bottles with fluorocarbon resin-lined caps for samples requiring metals analysis?	N	Y
If metals were the analytes of concern, did the sampling crew use containers cleaned with nonphosphate detergent and water, and rinsed with nitric acid, tap water, hydrochloric acid, tap water and finally Type II water?	unknown	N BF
If organics were the analytes of concern, did the sampling crew use containers cleaned with nonphosphate detergent, rinsed with tap water, distilled water, acetone, and finally pesticide quaility hexane?	unknown	N BF
Did the sampling crew filter samples requiring analysis for organics?	N	BF N

APPENDIX E RBT ANALYTICAL DATA SUMMARY

Columbia Analytical Services, Inc.

April 18, 1991

Bryant Adams
Pacific Wood Treating
111 West Division St.
Ridgefield, WA 98642

Re: **RBT - PWT Corp. Project**

Dear Bryant:

Enclosed are the results of the water samples submitted to our lab on March 28, 1991. For your reference, our service request number for this work is K911619.

All analyses were performed in accordance with the laboratory's quality assurance program.

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

David L. Edelman
Vice-President

DLE/das

317 South 13th Avenue • P.O. Box 479 • Kelso, Washington 98626 • Telephone 206/577-7222 • Fax 206/636-106

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific Wood Treating
Submitted By: Bryant Adams
Project: RBT - PWT Corp.
Sample Matrix: Water

Date Received: 03/28/91
Work Order #: K911619

Inorganic Parameters
mg/L (ppm)

Sample Name:			24	26, 3/27	28, 3/28
Lab Code:			K1619-1	K1619-3	K1619-4
Analytes	Method	MRL			
pH	150.1	-	7.99	6.34	6.28
Conductivity (μmhos/cm)	120.1	2	146	367	288
Chloride	300.0	0.2	5.3	1.3	1.2
Fluoride	300.0	0.2	0.2	ND	ND
Nitrogen, Nitrate	300.0	0.2	0.2	0.3	0.3
Sulfate	300.0	0.2	3.0	4.0	3.8
Total Organic Carbon (TOC)	415.1	0.5	2.5	1.1	1.8
Turbidity (NTU)	180.1	1	340	43	32

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Dave Ehlers / Date 4/18/91

00001

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Pacific Wood Treating
Submitted By: Bryant Adams
Project: RBT - PWT Corp.
Sample Matrix: Water

Date Received: 03/28/91
Work Order #: K911619

Inorganic Parameters
mg/L (ppm)

			Sample Name:	29	Method Blank
			Lab Code:	K1619-6	K1619-MB
Analytes	Method	MRL			
pH	150.1	-		6.04	-
Conductivity (μmhos/cm)	120.1	2		115	ND
Chloride	300.0	0.2		3.1	ND
Fluoride	300.0	0.2		ND	ND
Nitrogen, Nitrate	300.0	0.2		ND	ND
Sulfate	300.0	0.2		4.9	ND
Total Organic Carbon (TOC)	415.1	0.5		2.5	ND
Turbidity (NTU)	180.1	1		25	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Dave Shulman Date 4/18/91

00002

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Pacific Wood Treating	**Date Received:**	03/28/91
Submitted By:	Bryant Adams	**Work Order #:**	K911619
Project:	RBT - PWT Corp.		
Sample Matrix:	Water		

Dissolved Metals
mg/L (ppm)

Analytes:		Chromium	Arsenic
Method:		6010	7060
Method Reporting Limit:		0.005	0.005
Sample Name	**Lab Code**		
24	K1619-1	ND	ND
26 3/28	K1619-4	ND	ND
29	K1619-6	ND	ND
Method Blank	K1619-MB	ND	ND

ND None Detected at or above the method reporting limit

Approved by Dave Erdman / Date 4/18/91

00003

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Pacific Wood Treating	**Date Received:**	03/28/91
Submitted By:	Bryant Adams	**Date Extracted:**	04/03/91
Project:	RBT - PWT Corp.	**Date Analyzed:**	04/09/91
Sample Matrix:	Water	**Work Order #:**	K911619

Polynuclear Aromatic Hydrocarbons
EPA Methods 3510/8100
µg/L (ppb)

Sample Name:		24	25	26 3/27
Lab Code:		K1619-1	K1619-2	K1619-3
Analytes	**MRL**			
Naphthalene	1	ND	ND	ND
Acenaphthylene	1	ND	ND	ND
Acenaphthene	1	ND	ND	ND
Fluorene	1	ND	ND	ND
Phenanthrene	1	ND	ND	ND
Anthracene	1	ND	ND	ND
Fluoranthene	1	ND	ND	ND
Pyrene	1	ND	ND	ND
Benzo(a)anthracene	1	ND	ND	ND
Chrysene	1	ND	ND	ND
Benzo(b + k)fluoranthene*	2	ND	ND	ND
Benzo(a)pyrene	1	ND	ND	ND
Indeno(1,2,3-cd)pyrene and Dibenzo(a,h)anthracene*	2	ND	ND	ND
Benzo(g,h,i)perylene	1	ND	ND	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit
* Compounds co-elute; therefore, the results are reported as the combined concentration.

Approved by Dave Ehlman Date 4/18/91

00004

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Pacific Wood Treating	**Date Rece :**	03/28/91
Submitted By:	Bryant Adams	**Date Extra :**	04/03/91
Project:	RBT - PWT Corp.	**Date Ana :**	04/09/91
Sample Matrix:	Water	**Work Or :**	K911619

Polynuclear Aromatic Hydrocarbons
EPA Methods 3510/8100
µg/L (ppb)

Sample Name:		26 3/28	29	Method Blank
Lab Code:		K1619-4	K1619-6	K1619-MB
Analytes	**MRL**			
Naphthalene	1	ND	ND	ND
Acenaphthylene	1	ND	ND	ND
Acenaphthene	1	ND	ND	ND
Fluorene	1	ND	ND	ND
Phenanthrene	1	ND	ND	ND
Anthracene	1	ND	ND	ND
Fluoranthene	1	ND	ND	ND
Pyrene	1	ND	ND	ND
Benzo(a)anthracene	1	ND	ND	ND
Chrysene	1	ND	ND	ND
Benzo(b + k)fluoranthene*	2	ND	ND	ND
Benzo(a)pyrene	1	ND	ND	ND
Indeno(1,2,3-cd)pyrene and Dibenzo(a,h)anthracene*	2	ND	ND	ND
Benzo(g,h,i)perylene	1	ND	ND	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit
* Compounds co-elute; therefore, the results are reported as the combined concentration.

Approved by Dave Ekelman / Date 4/18/91

00005

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Pacific Wood Treating	**Date Received:**	03/28/91
Submitted By:	Bryant Adams	**Date Extracted:**	03/29/91
Project:	RBT - PWT Corp.	**Date Analyzed:**	04/01/91
Sample Matrix:	Water	**Work Order #:**	K911619

Chlorinated Phenolic Compounds
EPA Methods 3510/Modified 8150
µg/L (ppb)

Sample Name	Lab Code	MRL	Total Tetrachloro-phenols	Pentachloro-phenol
24	K1619-1	5	ND	ND
25	K1619-2	5	ND	ND
26 3/27	K1619-3	5	ND	ND
26 3/28	K1619-4	5	ND	ND
29	K1619-6	5	ND	ND
Method Blank	K1619-MB	5	ND	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Dave Edelman Date 4/18/91

00006

APPENDIX A

LABORATORY QC RESULTS

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COLUMBIA ANALYTICAL SERVICES, INC.

Client: Pacific Wood Treating
Submitted By: Bryant Adams
Project: RBT - PWT Corp.
Sample Matrix: Water

Date Received: 03/28/91
Work Order #: K911619

QA/QC Report
Duplicate Summary
Dissolved Metals
mg/L (ppm)

Sample Name: 24
Lab Code: K1619-1

Analytes	Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Arsenic	7060	0.005	ND	ND	ND	--
Chromium	6010	0.005	ND	ND	ND	--

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Dave Edelman / Date 4/18/91

00008

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Pacific Wood Treating	**Date Received:**	03/28/91
Submitted By:	Bryant Adams	**Work Order #:**	K911619
Project:	RBT - PWT Corp.		
Sample Matrix:	Water		

QA/QC Report
Matrix Spike Summary
Dissolved Metals
mg/L (ppm)

Sample Name: 24
Lab Code: K1619-1MS

Analytes	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery
Arsenic	0.005	0.04	ND	0.042	105
Chromium	0.005	0.2	ND	0.196	98

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by Dave Ekelman / Date 4/18/91

00009

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Pacific Wood Treating	**Date Received:**	03/28/91
Submitted By:	Bryant Adams	**Date Extracted:**	04/03/91
Project:	RBT - PWT Corp.	**Date Analyzed:**	04/09/91
Sample Matrix:	Water	**Work Order #:**	K911619

QA/QC Report
Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons
EPA Methods 3510/8100

Sample Name	Lab Code	Percent Recovery *p*-Terphenyl
24	K1619-1	64.3
25	K1619-2	48.6
26 3/27	K1619-3	77.5
26 3/28	K1619-4	73.6
29	K1619-6	75.7
Method Blank	K1619-MB	35.9
	CAS Acceptance Criteria	35-105

Approved by Dave Shelman / Date 4/10/91

00010

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Pacific Wood Treating	Date Received:	03/28/91
Submitted By:	Bryant Adams	Date Extracted:	03/29/91
Project:	RBT - PWT Corp.	Date Analyzed:	04/01/91
Sample Matrix:	Water	Work Order #:	K911619

QA/QC Report
Surrogate Recovery Summary
Chlorinated Phenolic Compounds
EPA Methods 3510/Modified 8150

Sample Name	Lab Code	Percent Recovery 4-Bromo-2,6-dichlorophenol
24	K1619-1	78.0
25	K1619-2	66.7
26 3/27	K1619-3	80.9
26 3/28	K1619-4	82.8
29	K1619-6	77.9
29	K1619-6MS	87.7
29	K1619-6DMS	84.6
Method Blank	K1619-MB	89.2
	CAS Acceptance Criteria	60-125

Approved by Dawn Edelman Date 4/8/91

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COLUMBIA ANALYTICAL SERVICES, INC.

Client: Pacific Wood Treating
Submitted By: Bryant Adams
Project: RBT - PWT Corp.
Sample Matrix: Water

Date Received: 03/28/91
Date Extracted: 03/29/91
Date Analyzed: 04/01/91
Work Order #: K911619

QA/QC Report
Matrix Spike/Duplicate Matrix Spike Summary
Chlorinated Phenolic Compounds
EPA Methods 3510/Modified 8150
µg/L (ppb)

Sample Name: 29
Lab Code: K1619-6MS/DMS

Analytes	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Criteria
Total Tetrachlorophenols	300	300	ND	256	250	85.3	83.3	50-120
Pentachlorophenol	150	150	ND	127	124	84.7	82.7	55-120

ND None Detected at or above the method reporting limit

Approved by Dave Ehlman Date 4/18/91

00012

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APPENDIX B

CHAIN OF CUSTODY INFORMATION

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K1619

Columbia Analytical Services inc.

1317 South 13th Avenue • Kelso, WA 98626 • 206/577-7222, Fax 206/636-1068

Chain of Custody/ Laboratory Analysis Request

DATE 24 Mar 91 PAGE 1 OF 1

PROJECT RBT - PWT Corp.

SEND REPORT TO Bryant Adams

ADDRESS 111 W. Div St Ridgefield

TELEPHONE# 206 887-3562

SAMPLERS NAME B. Adams PHONE# 887-3562

SAMPLERS SIGNATURE Bryant L Adams

	SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	ORGANIC ANALYSIS										INORGANIC ANALYSIS						OTHER		NUMBER OF CONTAINERS
						Base/Neut/Acid Organics GC/MS 625/8270	Volatile Organics GC/MS 624/8240	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020 BTEX	Gas/BTEX MOD 8015/8020	Pesticides/PCBs 608/8080	Total Petroleum Hydrocarbons - Mod 8015	Total Petroleum Hydrocarbons - 418.1	Total Organic Halides (TOX) 9020	Total Organic Carbon (TOC) 415/9060	EPTOX Metals As, Ba, Cd, Cr, Pb, Hg, Se, Ag	Metals (total or dissolved) List Below	Cyanide	Ph, Cond, Cl, SO4, Alk, F, Turb, NO3 (Circle)	NH3-N, COD, Total-P, TKN (Circle)	Coliform (Circle) Total, Fecal	PAH		
1.	24	3/27/91													✓		✓		✓			✓	✓	5
2.	25	3/27/91													✓				✓			✓	✓	~~3~~ 2
3.	26	3/27/91													✓				✓			✓	✓	
4.	26	3/28/91													✓		✓		✓			✓	✓	
5.	29	3/28/91													✓		✓		✓			✓	✓	5
6.	28	3/28/91				Archive																		5
7.																								
8.																								

Relinquished By	Relinquished By
Bryant L. Adams	
Signature Bryant L Adams	Signature
Printed Name	Printed Name
Firm	Firm
Date/Time 12:42	Date/Time
Received By: Ruth Allison	Received By:
Signature	Signature
Printed Name Ruth Allison	Printed Name
Firm CAS	Firm

Invoice Information:
P.O.#
Bill to:

Project Information
Site Contact:
Site Address:

Sample Receipt
Shipped Via:
Seals Intact:
Condition:
Lab No.
SR Number:

Special Instruction/Comments: Co Samples - Mike Bam David Nelson & Assoc.
Sampling observed by - Chris of PRC
* Filter Metals at Lab
metals btls K1619 1 & 5 can't be filtered at lab, already

00014

APPENDIX F EPA ANALYTICAL DATA SUMMARY

USEPA Region 10 Laboratory 11/28/90

Below are the definitions for qualifiers used in the Metals area when qualifying data from metals analysis.

Data Qualifiers

U	-	Element was analyzed for but not detected. The associated numerical value is the instrument detection limit/method detection limit.
J	-	The analyte was detected above the instrument detection limit but not quantified within expected limits of precision. The laboratory has established minimum quantitation limits having a relative standard deviation of no more than 10%.
E	-	The reported value is an estimate because of the presence of interference.
B	-	Analyte found in the analytical blank as well as the sample, indicating possible/probable contamination. "B" accompanies those analytical results within 10 (10x) times the instrument detection limit for the analyte of interest.
N	-	Spike sample recovery not within control limits.
NAR	-	There is no analysis result for this analyte.
NA	-	Not Applicable/Not Required.
*	-	The analyte was present in the sample.

Qualifier and Remark Codes
for
Manchester Environmental Laboratory Generated Data

Qualifier remark code	Definition
"B"	Analyte was also found in the analytical method blank indicating the sample may have been contaminated. (Not used when reporting organic data.)
"EXP"	The result is equal to the number before EXP times 10 to the power of the number after EXP. As an example 3EXP6 equals 3×10^6.
"E"	Reported result is an estimate because of the presence of interference. (Not used when reporting organic data.)
"J"	The analyte was positively identified. The associated numerical result is an estimate.
"N"	For organic analytes there is evidence the analyte is present in this sample. For metals analytes the spike sample recovery is not within control limits.
"NJ"	There is evidence that the analyte is present. The associated numerical result is an estimate.
"NAF"	Not analyzed for.
"p"	The analyte was detected above the instrument detection limit but below the established minimum quantitation limit. (Not used when reporting organic data.)
"REJ"	The data are unusable for all purposes.
"U"	The analyte was not detected at or above the reported result.
"UJ"	The analyte was not detected at or above the reported estimated result.
"*"	The analyte was present in the sample. (Visual Aid to locate detected compound on report sheet.)

Project: HWD-127A RIDGEFIELD BRICK AND TILE
Officer: MLB
Account: AGDD3A

Laboratory: EPA, Manchester

Sample No: 91 130150
Description: RB-B15-01 (Equipment rinsate blank) Grite
Source: Well (Test/Observation)

Begin Date: 91/03/27 11:15

Metals - Specified	Water-Total Result	Units
Arsenic As-Total	1.5U	ug/l
Chromium Cr-Total	0.4JB*	ug/l

VOA - PP Scan (GCMS)	Water-Total Result	Units
Carbon Tetrachloride	1U	ug/l
Acetone	12U	ug/l
Chloroform	1U	ug/l
Benzene	1U	ug/l
1,1,1-Trichloroethane	1U	ug/l
Bromomethane	1U	ug/l
Chloromethane	1U	ug/l
Dibromomethane	1U	ug/l
Bromochloromethane	1U	ug/l
Chloroethane	1U	ug/l
Vinyl Chloride	0.04J*	ug/l
Methylene Chloride	1U	ug/l
Carbon Disulfide	1U	ug/l
Bromoform	1U	ug/l
Bromodichloromethane	1U	ug/l
1,1-Dichloroethane	1U	ug/l
1,1-Dichloroethene	1U	ug/l
Trichlorofluoromethane	0.1J*	ug/l
Methane, Dichlorodiflu+	1U	ug/l
1,2-Dichloropropane	1U	ug/l
2-Butanone	2.6U	ug/l
1,1,2-Trichloroethane	1U	ug/l
Trichloroethene	1U	ug/l
ETHANE, 1,1,2,2-TETRAC+	1U	ug/l
1,2,3-Trichlorobenzene	1U	ug/l
Hexachlorobutadiene	1U	ug/l
Naphthalene	1U	ug/l
2-Chlorotoluene	1U	ug/l
1,2-Dichlorobenzene	1U	ug/l
1,2,4-Trimethylbenzene	1U	ug/l
1,2-Dibromo-3-chloropr+	1U	ug/l
1,2,3-Trichloropropane	1U	ug/l
Tert-Butylbenzene	1U	ug/l
Isopropylbenzene (Cume+	1U	ug/l
p-Isopropyltoluene	1U	ug/l
Ethylbenzene	1U	ug/l
BENZENE, ETHENYL-(STYR+	1U	ug/l
BENZENE, PROPYL-	1U	ug/l

VOA - PP Scan (GCMS) *** Continued ***	Water-Total Result	Units
Butylbenzene	1U	ug/l
4-Chlorotoluene	1U	ug/l
1,4-Dichlorobenzene	1U	ug/l
1,2-Dibromoethane (EDB)	1U	ug/l
1,2-Dichloroethane	0.4J*	ug/l
4-Methyl-2-Pentanone	1U	ug/l
1,3,5-Trimethylbenzene	1U	ug/l
Bromobenzene	1U	ug/l
Toluene	1U	ug/l
Chlorobenzene	1U	ug/l
1,2,4-Trichlorobenzene	1U	ug/l
Dibromochloromethane	1U	ug/l
Tetrachloroethene	1U	ug/l
Sec-Butylbenzene	1U	ug/l
1,3-Dichloropropane	1U	ug/l
Cis-1,2-Dichloroethene	1U	ug/l
trans-1,2-Dichloroethe+	1U	ug/l
1,3-Dichlorobenzene	1U	ug/l
1,1-Dichloropropene	1U	ug/l
2,2-Dichloropropane	1U	ug/l
2-Hexanone	1U	ug/l
Ethane, 1,1,1,2-Tetrac+	1U	ug/l
Total Xylenes	1U	ug/l
cis-1,3-Dichloropropene	1U	ug/l
trans-1,3-Dichloroprop+	1U	ug/l
p-Bromofluorobenzene	100	% Recov
Surrog: 1-Bromo-2-Fluo+	106	% Recov
d8-Toluene	99	% Recov
d4-1,2-Dichlorobenzene+	NAF	% Recov
1,2-Dichloroethane-d4 +	101	% Recov

B/N/Acid Scan	Water-Total Result	Units
Benzo(a)pyrene	0.06UJ	ug/l
2,4-Dinitrophenol	0.6UJ	ug/l
Dibenzo(a,h)anthracene	0.06UJ	ug/l
Benzo(a)anthracene	0.06UJ	ug/l
4-Chloro-3-Methylphenol	0.06UJ	ug/l
Acenaphthene	0.06UJ	ug/l
Phenanthrene	0.06UJ	ug/l
Fluorene	0.06UJ	ug/l
Carbazole	0.004J*	ug/l

B/N/Acid Scan *** Continued ***	Water-Total Result	Units
Pentachlorophenol	0.6UJ	ug/l
2,4,6-Trichlorophenol	0.06UJ	ug/l
2-Nitrophenol	0.06UJ	ug/l
Naphthalene, 1-Methyl-	0.06UJ	ug/l
Naphthalene	0.06UJ	ug/l
2-Methylnaphthalene	0.06UJ	ug/l
2-Chloronaphthalene	0.06UJ	ug/l
2-Methylphenol	0.06UJ	ug/l
o-Chlorophenol	0.06UJ	ug/l
2,4,5-Trichlorophenol	0.06UJ	ug/l
4-Nitrophenol	0.6UJ	ug/l
2,4-Dimethylphenol	0.06UJ	ug/l
4-Methylphenol	0.06UJ	ug/l
Phenol	0.1UJ	ug/l
Anthracene	0.06UJ	ug/l
2,4-Dichlorophenol	0.06UJ	ug/l
Pyrene	0.06UJ	ug/l
Dibenzofuran	0.06UJ	ug/l
Benzo(ghi)perylene	0.06UJ	ug/l
Indeno(1,2,3-cd)pyrene	0.06UJ	ug/l
Benzo(b)fluoranthene	0.02J*	ug/l
Fluoranthene	0.006J*	ug/l
Benzo(k)fluoranthene	0.02J*	ug/l
Acenaphthylene	0.06UJ	ug/l
Chrysene	0.06UJ	ug/l
Retene	0.06UJ	ug/l
4,6-Dinitro-2-methylph+	0.6UJ	ug/l
Surrog: 2,4,6-Tribromo+	NAR	% Recov
Surrog: 2-Fluorobiphen+	46	% Recov
Surrog: 2-Fluorophenol	31	% Recov
Surrog: D14-Terphenyl	84	% Recov
PYRENE-D10 (SS)	84	% Recov
Surrog: D5-Nitrobenzene	51	% Recov
Surrog: D5-Phenol	18	% Recov

(Sample Complete)

Project: HWD-127A RIDGEFIELD BRICK AND TILE Officer: MLB Account: AGDD3A

Laboratory: EPA, Manchester

Sample No: 91 130151 Description: RB-B15-01 (Equipment Rinsate Blank) Source: Well (Test/Observation)

Begin Date: 91/03/27 11:15

Metals - Specified		Water-Filtere Result	Units
Arsenic	As-Diss	1.5U	ug/l
Chromium	Cr-Diss	0.2JB*	ug/l

(Sample Complete)

Project: HWD-127A RIDGEFIELD BRICK AND TILE Officer: MLB Account: AGDD3A

Laboratory: EPA, Manchester

Sample No: 91 130152 Description: RB-B4-01 Source: Well (Test/Observation)

Begin Date: 91/03/27 12:30

Metals - Specified	Water-Total Result	Units
Arsenic As-Total	1.8J*	ug/l
Chromium Cr-Total	15.6 *	ug/l

Metals - Specified Matrix Spike #1	Water-Total Result	Units
Arsenic As-Total	136	% Recov
Chromium Cr-Total	98	% Recov

Metals - Specified Matrix Spike #2	Water-Total Result	Units
Arsenic As-Total	144	% Recov

VOA - PP Scan (GCMS)	Water-Total Result	Units
Carbon Tetrachloride	1U	ug/l
Acetone	1U	ug/l
Chloroform	1U	ug/l
Benzene	1U	ug/l
1,1,1-Trichloroethane	1U	ug/l
Bromomethane	1U	ug/l
Chloromethane	1U	ug/l
Dibromomethane	1U	ug/l
Bromochloromethane	1U	ug/l
Chloroethane	1U	ug/l
Vinyl Chloride	1U	ug/l
Methylene Chloride	1U	ug/l
Carbon Disulfide	1U	ug/l
Bromoform	1U	ug/l
Bromodichloromethane	1U	ug/l
1,1-Dichloroethane	1U	ug/l
1,1-Dichloroethene	1UJ	ug/l
Trichlorofluoromethane	1U	ug/l
Methane, Dichlorodiflu+	1U	ug/l
1,2-Dichloropropane	1U	ug/l
2-Butanone	1U	ug/l
1,1,2-Trichloroethane	1U	ug/l
Trichloroethene	1U	ug/l
ETHANE, 1,1,2,2-TETRAC+	1U	ug/l
1,2,3-Trichlorobenzene	1U	ug/l

VOA - PP Scan (GCMS) *** Continued ***	Water-Total Result	Units
Hexachlorobutadiene	1U	ug/l
Naphthalene	1U	ug/l
2-Chlorotoluene	1U	ug/l
1,2-Dichlorobenzene	1U	ug/l
1,2,4-Trimethylbenzene	1U	ug/l
1,2-Dibromo-3-chloropr+	1U	ug/l
1,2,3-Trichloropropane	1U	ug/l
Tert-Butylbenzene	1U	ug/l
Isopropylbenzene (Cume+	1U	ug/l
p-Isopropyltoluene	1U	ug/l
Ethylbenzene	1U	ug/l
BENZENE, ETHENYL-(STYR+	1U	ug/l
BENZENE, PROPYL-	1U	ug/l
Butylbenzene	1U	ug/l
4-Chlorotoluene	1U	ug/l
1,4-Dichlorobenzene	1U	ug/l
1,2-Dibromoethane (EDB)	1U	ug/l
1,2-Dichloroethane	0.8J*	ug/l
4-Methyl-2-Pentanone	1U	ug/l
1,3,5-Trimethylbenzene	1U	ug/l
Bromobenzene	1U	ug/l
Toluene	1U	ug/l
Chlorobenzene	1U	ug/l
1,2,4-Trichlorobenzene	1U	ug/l
Dibromochloromethane	1U	ug/l
Tetrachloroethene	1U	ug/l
Sec-Butylbenzene	1U	ug/l
1,3-Dichloropropane	1U	ug/l
Cis-1,2-Dichloroethene	1U	ug/l
trans-1,2-Dichloroethe+	1U	ug/l
1,3-Dichlorobenzene	1U	ug/l
1,1-Dichloropropene	1U	ug/l
2,2-Dichloropropane	1U	ug/l
2-Hexanone	1U	ug/l
Ethane, 1,1,1,2-Tetrac+	1U	ug/l
Total Xylenes	1U	ug/l
cis-1,3-Dichloropropene	1U	ug/l
trans-1,3-Dichloroprop+	1U	ug/l
p-Bromofluorobenzene	98	% Recov
Surrog: 1-Bromo-2-Fluo+	111	% Recov
d8-Toluene	100	% Recov
d4-1,2-Dichlorobenzene+	NAF	% Recov
1,2-Dichloroethane-d4 +	104	% Recov

VOA - PP Scan (GCMS) Matrix Spike #1	Water-Total Result	Units
Carbon Tetrachloride	84	% Recov
Acetone	150	% Recov
Chloroform	89	% Recov
Benzene	84	% Recov
1,1,1-Trichloroethane	88	% Recov
Bromomethane	69	% Recov
Chloromethane	65	% Recov
Dibromomethane	90	% Recov
Bromochloromethane	86	% Recov
Chloroethane	70	% Recov
Vinyl Chloride	68	% Recov
Methylene Chloride	96	% Recov
Carbon Disulfide	68	% Recov
Bromoform	90	% Recov
Bromodichloromethane	86	% Recov
1,1-Dichloroethane	88	% Recov
1,1-Dichloroethene	75	% Recov
Trichlorofluoromethane	67	% Recov
Methane, Dichlorodiflu+	58	% Recov
1,2-Dichloropropane	84	% Recov
2-Butanone	83	% Recov
1,1,2-Trichloroethane	87	% Recov
Trichloroethene	88	% Recov
ETHANE, 1,1,2,2-TETRAC+	88	% Recov
1,2,3-Trichlorobenzene	112	% Recov
Hexachlorobutadiene	90	% Recov
Naphthalene	125	% Recov
2-Chlorotoluene	87	% Recov
1,2-Dichlorobenzene	87	% Recov
1,2,4-Trimethylbenzene	84	% Recov
1,2-Dibromo-3-chloropr+	99	% Recov
1,2,3-Trichloropropane	80	% Recov
Tert-Butylbenzene	81	% Recov
Isopropylbenzene (Cume+	80	% Recov
p-Isopropyltoluene	81	% Recov
Ethylbenzene	80	% Recov
BENZENE, ETHENYL-(STYR+	80	% Recov
BENZENE, PROPYL-	82	% Recov
Butylbenzene	83	% Recov
4-Chlorotoluene	88	% Recov
1,4-Dichlorobenzene	92	% Recov
1,2-Dibromoethane (EDB)	88	% Recov
1,2-Dichloroethane	48	% Recov
4-Methyl-2-Pentanone	98	% Recov
1,3,5-Trimethylbenzene	81	% Recov

(Continued on next page)

Project: HWD-127A RIDGEFIELD BRICK AND TILE Officer: MLB Account: AGDD3A

Laboratory: EPA, Manchester

Sample No: 91 130152 Description: RB-B4-01 Source: Well (Test/Observation)

Begin Date: 91/03/27 12:30

VOA - PP Scan (GCMS) *** Continued *** Matrix Spike #1	Water-Total Result	Units
Bromobenzene	86	% Recov
Toluene	87	% Recov
Chlorobenzene	86	% Recov
1,2,4-Trichlorobenzene	106	% Recov
Dibromochloromethane	83	% Recov
Tetrachloroethene	88	% Recov
Sec-Butylbenzene	78	% Recov
1,3-Dichloropropane	85	% Recov
Cis-1,2-Dichloroethene	84	% Recov
trans-1,2-Dichloroethe+	80	% Recov
1,3-Dichlorobenzene	90	% Recov
1,1-Dichloropropene	81	% Recov
2,2-Dichloropropane	86	% Recov
2-Hexanone	90	% Recov
Ethane, 1,1,1,2-Tetrac+	89	% Recov
Total Xylenes	80	% Recov
d8-Toluene	98	% Recov
cis-1,3-Dichloropropene	79	% Recov
trans-1,3-Dichloroprop+	78	% Recov
p-Bromofluorobenzene	99	% Recov
Surrog: 1-Bromo-2-Fluo+	107	% Recov
d4-1,2-Dichlorobenzene+	NAF	% Recov
1,2-Dichloroethane-d4 +	101	% Recov

VOA - PP Scan (GCMS) Matrix Spike #2	Water-Total Result	Units
Carbon Tetrachloride	86	% Recov
Acetone	126	% Recov
Chloroform	88	% Recov
Benzene	80	% Recov
1,1,1-Trichloroethane	83	% Recov
Bromomethane	94	% Recov
Chloromethane	80	% Recov
Dibromomethane	78	% Recov
Bromochloromethane	88	% Recov
Chloroethane	91	% Recov
Vinyl Chloride	80	% Recov
Methylene Chloride	123	% Recov
Carbon Disulfide	85	% Recov
Bromoform	84	% Recov
Bromodichloromethane	82	% Recov
1,1-Dichloroethane	94	% Recov

VOA - PP Scan (GCMS) *** Continued *** Matrix Spike #2	Water-Total Result	Units
1,1-Dichloroethene	90	% Recov
Trichlorofluoromethane	96	% Recov
Methane, Dichlorodiflu+	37	% Recov
1,2-Dichloropropane	80	% Recov
2-Butanone	78	% Recov
1,1,2-Trichloroethane	78	% Recov
Trichloroethene	82	% Recov
ETHANE, 1,1,2,2-TETRAC+	84	% Recov
1,2,3-Trichlorobenzene	102	% Recov
Hexachlorobutadiene	92	% Recov
Naphthalene	98	% Recov
2-Chlorotoluene	88	% Recov
1,2-Dichlorobenzene	88	% Recov
1,2,4-Trimethylbenzene	83	% Recov
1,2-Dibromo-3-chloropr+	93	% Recov
1,2,3-Trichloropropane	80	% Recov
Tert-Butylbenzene	82	% Recov
Isopropylbenzene (Cume+	80	% Recov
p-Isopropyltoluene	80	% Recov
Ethylbenzene	81	% Recov
BENZENE, ETHENYL-(STYR+	82	% Recov
BENZENE, PROPYL-	84	% Recov
Butylbenzene	80	% Recov
4-Chlorotoluene	86	% Recov
1,4-Dichlorobenzene	90	% Recov
1,2-Dibromoethane (EDB)	78	% Recov
1,2-Dichloroethane	45	% Recov
4-Methyl-2-Pentanone	83	% Recov
1,3,5-Trimethylbenzene	80	% Recov
Bromobenzene	87	% Recov
Toluene	81	% Recov
Chlorobenzene	86	% Recov
1,2,4-Trichlorobenzene	96	% Recov
Dibromochloromethane	80	% Recov
Tetrachloroethene	83	% Recov
Sec-Butylbenzene	80	% Recov
1,3-Dichloropropane	78	% Recov
Cis-1,2-Dichloroethene	84	% Recov
trans-1,2-Dichloroethe+	90	% Recov
1,3-Dichlorobenzene	88	% Recov
1,1-Dichloropropene	80	% Recov
2,2-Dichloropropane	90	% Recov
2-Hexanone	78	% Recov
Ethane, 1,1,1,2-Tetrac+	84	% Recov

VOA - PP Scan (GCMS) *** Continued *** Matrix Spike #2	Water-Total Result	Units
Total Xylenes	81	% Recov
d8-Toluene	96	% Recov
cis-1,3-Dichloropropene	75	% Recov
trans-1,3-Dichloroprop+	72	% Recov
p-Bromofluorobenzene	101	% Recov
Surrog: 1-Bromo-2-Fluo+	98	% Recov
d4-1,2-Dichlorobenzene+	NAF	% Recov
1,2-Dichloroethane-d4 +	98	% Recov

B/N/Acid Scan	Water-Total Result	Units
Benzo(a)pyrene	0.03J*	ug/l
2,4-Dinitrophenol	0.6UJ	ug/l
Dibenzo(a,h)anthracene	0.06UJ	ug/l
Benzo(a)anthracene	0.06UJ	ug/l
4-Chloro-3-Methylphenol	0.06UJ	ug/l
Acenaphthene	0.0006J*	ug/l
Phenanthrene	0.005J*	ug/l
Fluorene	0.06UJ	ug/l
Carbazole	0.02J*	ug/l
Pentachlorophenol	0.02J*	ug/l
2,4,6-Trichlorophenol	0.06UJ	ug/l
2-Nitrophenol	0.06UJ	ug/l
Naphthalene, 1-Methyl-	0.06UJ	ug/l
Naphthalene	0.06UJ	ug/l
2-Methylnaphthalene	0.002J*	ug/l
2-Chloronaphthalene	0.06UJ	ug/l
2-Methylphenol	0.06UJ	ug/l
o-Chlorophenol	0.06UJ	ug/l
2,4,5-Trichlorophenol	0.06UJ	ug/l
4-Nitrophenol	0.6UJ	ug/l
2,4-Dimethylphenol	0.06UJ	ug/l
4-Methylphenol	0.0003J*	ug/l
Phenol	0.06UJ	ug/l
Anthracene	0.06UJ	ug/l
2,4-Dichlorophenol	0.06UJ	ug/l
Pyrene	0.02J*	ug/l
Dibenzofuran	0.001J*	ug/l
Benzo(ghi)perylene	0.06UJ	ug/l
Indeno(1,2,3-cd)pyrene	0.06UJ	ug/l
Benzo(b)fluoranthene	0.04J*	ug/l
Fluoranthene	0.01J*	ug/l

(Continued on next page)

Project: HWD-127A RIDGEFIELD BRICK AND TILE
Officer: MLB
Account: AGDD3A

Laboratory: EPA, Manchester

Sample No: 91 130152
Description: RB-B4-01
Source: Well (Test/Observation)

Begin Date: 91/03/27 12:30

B/N/Acid Scan *** Continued ***	Water-Total Result	Units
Benzo(k)fluoranthene	0.03J*	ug/l
Acenaphthylene	0.06UJ	ug/l
Chrysene	0.06UJ	ug/l
Retene	0.06UJ	ug/l
4,6-Dinitro-2-methylph+	0.6UJ	ug/l
Surrog: 2,4,6-Tribromo+	NAR	% Recov
Surrog: 2-Fluorobiphen+	37	% Recov
Surrog: 2-Fluorophenol	24	% Recov
Surrog: D14-Terphenyl	71	% Recov
PYRENE-D10 (SS)	64	% Recov
Surrog: D5-Nitrobenzene	42	% Recov
Surrog: D5-Phenol	16	% Recov

B/N/Acid Scan Matrix Spike #1	Water-Total Result	Units
Benzo(a)pyrene	74	% Recov
2,4-Dinitrophenol	98	% Recov
Dibenzo(a,h)anthracene	61	% Recov
Benzo(a)anthracene	81	% Recov
4-Chloro-3-Methylphenol	73	% Recov
Acenaphthene	71	% Recov
Phenanthrene	79	% Recov
Fluorene	79	% Recov
Carbazole	NAR	% Recov
Pentachlorophenol	105	% Recov
2,4,6-Trichlorophenol	72	% Recov
2-Nitrophenol	91	% Recov
Naphthalene, 1-Methyl-	NAR	% Recov
Naphthalene	67	% Recov
2-Methylnaphthalene	38	% Recov
2-Chloronaphthalene	49	% Recov
2-Methylphenol	65	% Recov
o-Chlorophenol	77	% Recov
2,4,5-Trichlorophenol	90	% Recov
4-Nitrophenol	26	% Recov
2,4-Dimethylphenol	50	% Recov
4-Methylphenol	49	% Recov
Phenol	21	% Recov
Anthracene	69	% Recov
2,4-Dichlorophenol	74	% Recov
Pyrene	83	% Recov
Dibenzofuran	65	% Recov

B/N/Acid Scan *** Continued *** Matrix Spike #1	Water-Total Result	Units
Benzo(ghi)perylene	68	% Recov
Indeno(1,2,3-cd)pyrene	72	% Recov
Benzo(b)fluoranthene	73	% Recov
Fluoranthene	84	% Recov
Benzo(k)fluoranthene	75	% Recov
Acenaphthylene	71	% Recov
Chrysene	84	% Recov
Retene	NAR	% Recov
4,6-Dinitro-2-methylph+	74	% Recov
Surrog: 2,4,6-Tribromo+	NAR	% Recov
Surrog: 2-Fluorobiphen+	57	% Recov
Surrog: 2-Fluorophenol	38	% Recov
Surrog: D14-Terphenyl	71	% Recov
PYRENE-D10 (SS)	80	% Recov
Surrog: D5-Nitrobenzene	87	% Recov
Surrog: D5-Phenol	20	% Recov

B/N/Acid Scan Matrix Spike #2	Water-Total Result	Units
Benzo(a)pyrene	56	% Recov
2,4-Dinitrophenol	94	% Recov
Dibenzo(a,h)anthracene	55	% Recov
Benzo(a)anthracene	77	% Recov
4-Chloro-3-Methylphenol	78	% Recov
Acenaphthene	84	% Recov
Phenanthrene	82	% Recov
Fluorene	88	% Recov
Carbazole	NAR	% Recov
Pentachlorophenol	106	% Recov
2,4,6-Trichlorophenol	76	% Recov
2-Nitrophenol	95	% Recov
Naphthalene, 1-Methyl-	NAR	% Recov
Naphthalene	82	% Recov
2-Methylnaphthalene	50	% Recov
2-Chloronaphthalene	64	% Recov
2-Methylphenol	57	% Recov
o-Chlorophenol	76	% Recov
2,4,5-Trichlorophenol	90	% Recov
4-Nitrophenol	20	% Recov
2,4-Dimethylphenol	41	% Recov
4-Methylphenol	38	% Recov
Phenol	20	% Recov

B/N/Acid Scan *** Continued *** Matrix Spike #2	Water-Total Result	Units
Anthracene	60	% Recov
2,4-Dichlorophenol	76	% Recov
Pyrene	83	% Recov
Dibenzofuran	78	% Recov
Benzo(ghi)perylene	58	% Recov
Indeno(1,2,3-cd)pyrene	63	% Recov
Benzo(b)fluoranthene	64	% Recov
Fluoranthene	82	% Recov
Benzo(k)fluoranthene	67	% Recov
Acenaphthylene	83	% Recov
Chrysene	77	% Recov
Retene	NAR	% Recov
4,6-Dinitro-2-methylph+	83	% Recov
Surrog: 2,4,6-Tribromo+	NAR	% Recov
Surrog: 2-Fluorobiphen+	75	% Recov
Surrog: 2-Fluorophenol	40	% Recov
Surrog: D14-Terphenyl	72	% Recov
PYRENE-D10 (SS)	92	% Recov
Surrog: D5-Nitrobenzene	100	% Recov
Surrog: D5-Phenol	21	% Recov

(Sample Complete)

Project: HWD-127A RIDGEFIELD BRICK AND TILE Officer: MLB Account: AGDD3A

Laboratory: EPA, Manchester

Sample No: 91 130153 Description: RB-B4-01 Source: Well (Test/Observation)

Begin Date: 91/03/27 12:30

Metals - Specified		Water-Filtere Result	Units
Arsenic	As-Diss	1.5U	ug/l
Chromium	Cr-Diss	1.3B*	ug/l

(Sample Complete)

Project: HWD-127A RIDGEFIELD BRICK AND TILE Officer: MLB Account: AGDD3A

Laboratory: EPA, Manchester

Sample No: 91 130154 Description: RB-B10-01 (Duplicate of B-H) B.F. Source: Well (Test/Observation)

Begin Date: 91/03/27 12:45

Metals - Specified	Water-Total Result	Units
Arsenic As-Total	2.4J*	ug/l
Chromium Cr-Total	14.5 *	ug/l

VOA - PP Scan (GCMS)	Water-Total Result	Units
Carbon Tetrachloride	1U	ug/l
Acetone	1U	ug/l
Chloroform	1U	ug/l
Benzene	1U	ug/l
1,1,1-Trichloroethane	1U	ug/l
Bromomethane	1U	ug/l
Chloromethane	0.05J*	ug/l
Dibromomethane	1U	ug/l
Bromochloromethane	1U	ug/l
Chloroethane	1U	ug/l
Vinyl Chloride	1U	ug/l
Methylene Chloride	1U	ug/l
Carbon Disulfide	0.2J*	ug/l
Bromoform	1U	ug/l
Bromodichloromethane	1U	ug/l
1,1-Dichloroethane	1U	ug/l
1,1-Dichloroethene	1U	ug/l
Trichlorofluoromethane	1U	ug/l
Methane, Dichlorodiflu+	1U	ug/l
1,2-Dichloropropane	1U	ug/l
2-Butanone	1U	ug/l
1,1,2-Trichloroethane	1U	ug/l
Trichloroethene	1U	ug/l
ETHANE, 1,1,2,2-TETRAC+	1U	ug/l
1,2,3-Trichlorobenzene	1U	ug/l
Hexachlorobutadiene	1U	ug/l
Naphthalene	1U	ug/l
2-Chlorotoluene	1U	ug/l
1,2-Dichlorobenzene	1U	ug/l
1,2,4-Trimethylbenzene	1U	ug/l
1,2-Dibromo-3-chloropr+	1U	ug/l
1,2,3-Trichloropropane	1U	ug/l
Tert-Butylbenzene	1U	ug/l
Isopropylbenzene (Cume+	1U	ug/l
p-Isopropyltoluene	1U	ug/l
Ethylbenzene	1U	ug/l
BENZENE, ETHENYL-(STYR+	1U	ug/l
BENZENE, PROPYL-	1U	ug/l

VOA - PP Scan (GCMS) *** Continued ***	Water-Total Result	Units
Butylbenzene	1U	ug/l
4-Chlorotoluene	1U	ug/l
1,4-Dichlorobenzene	1U	ug/l
1,2-Dibromoethane (EDB)	1U	ug/l
1,2-Dichloroethane	0.2J*	ug/l
4-Methyl-2-Pentanone	1U	ug/l
1,3,5-Trimethylbenzene	1U	ug/l
Bromobenzene	1U	ug/l
Toluene	1U	ug/l
Chlorobenzene	1U	ug/l
1,2,4-Trichlorobenzene	1U	ug/l
Dibromochloromethane	1U	ug/l
Tetrachloroethene	1U	ug/l
Sec-Butylbenzene	1U	ug/l
1,3-Dichloropropane	1U	ug/l
Cis-1,2-Dichloroethene	1U	ug/l
trans-1,2-Dichloroethe+	1U	ug/l
1,3-Dichlorobenzene	1U	ug/l
1,1-Dichloropropene	1U	ug/l
2,2-Dichloropropane	1U	ug/l
2-Hexanone	1U	ug/l
Ethane, 1,1,1,2-Tetrac+	1U	ug/l
Total Xylenes	1U	ug/l
cis-1,3-Dichloropropene	1U	ug/l
trans-1,3-Dichloroprop+	1U	ug/l
p-Bromofluorobenzene	96	% Recov
Surrog: 1-Bromo-2-Fluo+	120	% Recov
d8-Toluene	100	% Recov
d4-1,2-Dichlorobenzene+	NAF	% Recov
1,2-Dichloroethane-d4 +	108	% Recov

B/N/Acid Scan	Water-Total Result	Units
Benzo(a)pyrene	0.03J*	ug/l
2,4-Dinitrophenol	0.6UJ	ug/l
Dibenzo(a,h)anthracene	0.02J*	ug/l
Benzo(a)anthracene	0.06UJ	ug/l
4-Chloro-3-Methylphenol	0.06UJ	ug/l
Acenaphthene	0.0006J*	ug/l
Phenanthrene	0.007J*	ug/l
Fluorene	0.06UJ	ug/l
Carbazole	0.06UJ	ug/l

B/N/Acid Scan *** Continued ***	Water-Total Result	Units
Pentachlorophenol	0.02J*	ug/l
2,4,6-Trichlorophenol	0.06UJ	ug/l
2-Nitrophenol	0.06UJ	ug/l
Naphthalene, 1-Methyl-	0.003J*	ug/l
Naphthalene	0.06UJ	ug/l
2-Methylnaphthalene	0.003J*	ug/l
2-Chloronaphthalene	0.06UJ	ug/l
2-Methylphenol	0.06UJ	ug/l
o-Chlorophenol	0.06UJ	ug/l
2,4,5-Trichlorophenol	0.06UJ	ug/l
4-Nitrophenol	0.6UJ	ug/l
2,4-Dimethylphenol	0.06UJ	ug/l
4-Methylphenol	0.06UJ	ug/l
Phenol	0.07UJ	ug/l
Anthracene	0.06UJ	ug/l
2,4-Dichlorophenol	0.06UJ	ug/l
Pyrene	0.01J*	ug/l
Dibenzofuran	0.06UJ	ug/l
Benzo(ghi)perylene	0.06UJ	ug/l
Indeno(1,2,3-cd)pyrene	0.06UJ	ug/l
Benzo(b)fluoranthene	0.03J*	ug/l
Fluoranthene	0.008J*	ug/l
Benzo(k)fluoranthene	0.03J*	ug/l
Acenaphthylene	0.06UJ	ug/l
Chrysene	0.06UJ	ug/l
Retene	0.06UJ	ug/l
4,6-Dinitro-2-methylph+	0.6UJ	ug/l
Surrog: 2,4,6-Tribromo+	NAR	% Recov
Surrog: 2-Fluorobiphen+	46	% Recov
Surrog: 2-Fluorophenol	33	% Recov
Surrog: D14-Terphenyl	69	% Recov
PYRENE-D10 (SS)	62	% Recov
Surrog: D5-Nitrobenzene	50	% Recov
Surrog: D5-Phenol	21	% Recov

(Sample Complete)

Project: HWD-127A RIDGEFIELD BRICK AND TILE Officer: MLB Account: AGDD3A

Laboratory: EPA, Manchester

Sample No: 91 130155 Description: RB-B10-01 (Duplicate of B-4) BF Source: Well (Test/Observation)

Begin Date: 91/03/27 12:45

Metals - Specified		Water-Filtere Result	Units
Arsenic	As-Diss	1.5U	ug/l
Chromium	Cr-Diss	1.1B*	ug/l

(Sample Complete)

Project: HWD-127A RIDGEFIELD BRICK AND TILE Officer: MLB Account: AGDD3A

Laboratory: EPA, Manchester

Sample No: 91 130156 Description: RB-B5-01 Source: Well (Test/Observation)

Begin Date: 91/03/27 15:00

VOA - PP Scan (GCMS)	Water-Total Result	Units
Carbon Tetrachloride	1U	ug/l
Acetone	1U	ug/l
Chloroform	0.1J*	ug/l
Benzene	1U	ug/l
1,1,1-Trichloroethane	1U	ug/l
Bromomethane	1U	ug/l
Chloromethane	0.1J*	ug/l
Dibromomethane	1U	ug/l
Bromochloromethane	1U	ug/l
Chloroethane	1U	ug/l
Vinyl Chloride	1U	ug/l
Methylene Chloride	1U	ug/l
Carbon Disulfide	1U	ug/l
Bromoform	1U	ug/l
Bromodichloromethane	1U	ug/l
1,1-Dichloroethane	1U	ug/l
1,1-Dichloroethene	1U	ug/l
Trichlorofluoromethane	1U	ug/l
Methane, Dichlorodiflu+	1U	ug/l
1,2-Dichloropropane	1U	ug/l
2-Butanone	1.1U	ug/l
1,1,2-Trichloroethane	1U	ug/l
Trichloroethene	1U	ug/l
ETHANE, 1,1,2,2-TETRAC+	1U	ug/l
1,2,3-Trichlorobenzene	1U	ug/l
Hexachlorobutadiene	1U	ug/l
Naphthalene	1U	ug/l
2-Chlorotoluene	1U	ug/l
1,2-Dichlorobenzene	1U	ug/l
1,2,4-Trimethylbenzene	1U	ug/l
1,2-Dibromo-3-chloropr+	1U	ug/l
1,2,3-Trichloropropane	1U	ug/l
Tert-Butylbenzene	1U	ug/l
Isopropylbenzene (Cume+	1U	ug/l
p-Isopropyltoluene	1U	ug/l
Ethylbenzene	1U	ug/l
BENZENE, ETHENYL-(STYR+	1U	ug/l
BENZENE, PROPYL-	1U	ug/l
Butylbenzene	1U	ug/l
4-Chlorotoluene	1U	ug/l
1,4-Dichlorobenzene	1U	ug/l
1,2-Dibromoethane (EDB)	1U	ug/l
1,2-Dichloroethane	0.5J*	ug/l
4-Methyl-2-Pentanone	1U	ug/l
1,3,5-Trimethylbenzene	1U	ug/l

VOA - PP Scan (GCMS) *** Continued ***	Water-Total Result	Units
Bromobenzene	1U	ug/l
Toluene	1U	ug/l
Chlorobenzene	1U	ug/l
1,2,4-Trichlorobenzene	1U	ug/l
Dibromochloromethane	1U	ug/l
Tetrachloroethene	1U	ug/l
Sec-Butylbenzene	1U	ug/l
1,3-Dichloropropane	1U	ug/l
Cis-1,2-Dichloroethene	1U	ug/l
trans-1,2-Dichloroethe+	1U	ug/l
1,3-Dichlorobenzene	1U	ug/l
1,1-Dichloropropene	1U	ug/l
2,2-Dichloropropane	1U	ug/l
2-Hexanone	1U	ug/l
Ethane, 1,1,1,2-Tetrac+	1U	ug/l
Total Xylenes	1U	ug/l
cis-1,3-Dichloropropene	1U	ug/l
trans-1,3-Dichloroprop+	1U	ug/l
p-Bromofluorobenzene	101	% Recov
Surrog: 1-Bromo-2-Fluo+	118	% Recov
d8-Toluene	101	% Recov
d4-1,2-Dichlorobenzene+	NAF	% Recov
1,2-Dichloroethane-d4 +	111	% Recov

B/N/Acid Scan	Water-Total Result	Units
Benzo(a)pyrene	0.04J*	ug/l
2,4-Dinitrophenol	1UJ	ug/l
Dibenzo(a,h)anthracene	0.1UJ	ug/l
Benzo(a)anthracene	0.1UJ	ug/l
4-Chloro-3-Methylphenol	0.1UJ	ug/l
Acenaphthene	0.001J*	ug/l
Phenanthrene	0.02J*	ug/l
Fluorene	0.002J*	ug/l
Carbazole	0.1UJ	ug/l
Pentachlorophenol	0.06J*	ug/l
2,4,6-Trichlorophenol	0.1UJ	ug/l
2-Nitrophenol	0.1UJ	ug/l
Naphthalene, 1-Methyl-	0.005J*	ug/l
Naphthalene	0.1UJ	ug/l
2-Methylnaphthalene	0.005J*	ug/l
2-Chloronaphthalene	0.1UJ	ug/l

B/N/Acid Scan *** Continued ***	Water-Total Result	Units
2-Methylphenol	0.1UJ	ug/l
o-Chlorophenol	0.1UJ	ug/l
2,4,5-Trichlorophenol	0.1UJ	ug/l
4-Nitrophenol	1UJ	ug/l
2,4-Dimethylphenol	0.1UJ	ug/l
4-Methylphenol	0.1UJ	ug/l
Phenol	0.1UJ	ug/l
Anthracene	0.1UJ	ug/l
2,4-Dichlorophenol	0.1UJ	ug/l
Pyrene	0.02J*	ug/l
Dibenzofuran	0.1UJ	ug/l
Benzo(ghi)perylene	0.1UJ	ug/l
Indeno(1,2,3-cd)pyrene	0.1UJ	ug/l
Benzo(b)fluoranthene	0.06J*	ug/l
Fluoranthene	0.02J*	ug/l
Benzo(k)fluoranthene	0.03J*	ug/l
Acenaphthylene	0.1UJ	ug/l
Chrysene	0.1UJ	ug/l
Retene	0.1UJ	ug/l
4,6-Dinitro-2-methylph+	1UJ	ug/l
Surrog: 2,4,6-Tribromo+	NAR	% Recov
Surrog: 2-Fluorobiphen+	49	% Recov
Surrog: 2-Fluorophenol	42	% Recov
Surrog: D14-Terphenyl	66	% Recov
PYRENE-D10 (SS)	43	% Recov
Surrog: D5-Nitrobenzene	51	% Recov
Surrog: D5-Phenol	31	% Recov

(Sample Complete)

Project: HWD-127A RIDGEFIELD BRICK AND TILE Officer: MLB Account: AGDD3A

Laboratory: EPA, Manchester

Sample No: 91 130158 Description: RB-B6-01 Source: Well (Test/Observation)

Begin Date: 91/03/27 15:20

Metals - Specified	Water-Total Result	Units
Arsenic As-Total	1.9J*	ug/l
Chromium Cr-Total	1.7B*	ug/l

VOA - PP Scan (GCMS)	Water-Total Result	Units
Carbon Tetrachloride	1U	ug/l
Acetone	1U	ug/l
Chloroform	1U	ug/l
Benzene	1U	ug/l
1,1,1-Trichloroethane	1U	ug/l
Bromomethane	1U	ug/l
Chloromethane	1U	ug/l
Dibromomethane	1U	ug/l
Bromochloromethane	1U	ug/l
Chloroethane	1U	ug/l
Vinyl Chloride	1U	ug/l
Methylene Chloride	1U	ug/l
Carbon Disulfide	1.6U	ug/l
Bromoform	1U	ug/l
Bromodichloromethane	1U	ug/l
1,1-Dichloroethane	1U	ug/l
1,1-Dichloroethene	1U	ug/l
Trichlorofluoromethane	1U	ug/l
Methane, Dichlorodiflu+	1U	ug/l
1,2-Dichloropropane	1U	ug/l
2-Butanone	1U	ug/l
1,1,2-Trichloroethane	1U	ug/l
Trichloroethene	1U	ug/l
ETHANE, 1,1,2,2-TETRAC+	1U	ug/l
1,2,3-Trichlorobenzene	1U	ug/l
Hexachlorobutadiene	1U	ug/l
Naphthalene	1U	ug/l
2-Chlorotoluene	1U	ug/l
1,2-Dichlorobenzene	1U	ug/l
1,2,4-Trimethylbenzene	1U	ug/l
1,2-Dibromo-3-chloropr+	1U	ug/l
1,2,3-Trichloropropane	1U	ug/l
Tert-Butylbenzene	1U	ug/l
Isopropylbenzene (Cume+	1U	ug/l
p-Isopropyltoluene	1U	ug/l
Ethylbenzene	1U	ug/l
BENZENE, ETHENYL-(STYR+	1U	ug/l
BENZENE, PROPYL-	1U	ug/l

VOA - PP Scan (GCMS) *** Continued ***	Water-Total Result	Units
Butylbenzene	1U	ug/l
4-Chlorotoluene	1U	ug/l
1,2-Dichlorobenzene	1U	ug/l
1,2-Dibromoethane (EDB)	1U	ug/l
1,2-Dichloroethane	1U	ug/l
4-Methyl-2-Pentanone	1U	ug/l
1,3,5-Trimethylbenzene	1U	ug/l
Bromobenzene	1U	ug/l
Toluene	1U	ug/l
Chlorobenzene	1U	ug/l
1,2,4-Trichlorobenzene	1U	ug/l
Dibromochloromethane	1U	ug/l
Tetrachloroethene	1U	ug/l
Sec-Butylbenzene	1U	ug/l
1,3-Dichloropropane	1U	ug/l
Cis-1,2-Dichloroethene	1U	ug/l
trans-1,2-Dichloroethe+	1U	ug/l
1,3-Dichlorobenzene	1U	ug/l
1,1-Dichloropropene	1U	ug/l
2,2-Dichloropropane	1U	ug/l
2-Hexanone	1U	ug/l
Ethane, 1,1,1,2-Tetrac+	1U	ug/l
Total Xylenes	1U	ug/l
cis-1,3-Dichloropropene	1U	ug/l
trans-1,3-Dichloroprop+	1U	ug/l
p-Bromofluorobenzene	100	% Recov
Surrog: 1-Bromo-2-Fluo+	122	% Recov
d8-Toluene	98	% Recov
d4-1,2-Dichlorobenzene+	NAF	% Recov
1,2-Dichloroethane-d4 +	111	% Recov

B/N/Acid Scan	Water-Total Result	Units
Benzo(a)pyrene	0.05J*	ug/l
2,4-Dinitrophenol	0.7UJ	ug/l
Dibenzo(a,h)anthracene	0.07UJ	ug/l
Benzo(a)anthracene	0.07UJ	ug/l
4-Chloro-3-Methylphenol	0.07UJ	ug/l
Acenaphthene	0.002J*	ug/l
Phenanthrene	0.01J*	ug/l
Fluorene	0.07UJ	ug/l
Carbazole	0.07U	ug/l

B/N/Acid Scan *** Continued ***	Water-Total Result	Units
Pentachlorophenol	0.06J*	ug/l
2,4,6-Trichlorophenol	0.07UJ	ug/l
2-Nitrophenol	0.07UJ	ug/l
Naphthalene, 1-Methyl-	0.005J*	ug/l
Naphthalene	0.07UJ	ug/l
2-Methylnaphthalene	0.004J*	ug/l
2-Chloronaphthalene	0.07UJ	ug/l
2-Methylphenol	0.07UJ	ug/l
o-Chlorophenol	0.07UJ	ug/l
2,4,5-Trichlorophenol	0.07UJ	ug/l
4-Nitrophenol	0.7UJ	ug/l
2,4-Dimethylphenol	0.07UJ	ug/l
4-Methylphenol	0.07UJ	ug/l
Phenol	0.9J*	ug/l
Anthracene	0.07UJ	ug/l
2,4-Dichlorophenol	0.07UJ	ug/l
Pyrene	0.02J*	ug/l
Dibenzofuran	0.002J*	ug/l
Benzo(ghi)perylene	0.02J*	ug/l
Indeno(1,2,3-cd)pyrene	0.07UJ	ug/l
Benzo(b)fluoranthene	0.04J*	ug/l
Fluoranthene	0.01J*	ug/l
Benzo(k)fluoranthene	0.02J*	ug/l
Acenaphthylene	0.07UJ	ug/l
Chrysene	0.07UJ	ug/l
Retene	0.07UJ	ug/l
4,6-Dinitro-2-methylph+	0.7UJ	ug/l
Surrog: 2,4,6-Tribromo+	NAR	% Recov
Surrog: 2-Fluorobiphen+	55	% Recov
Surrog: 2-Fluorophenol	36	% Recov
Surrog: D14-Terphenyl	81	% Recov
PYRENE-D10 (SS)	80	% Recov
Surrog: D5-Nitrobenzene	55	% Recov
Surrog: D5-Phenol	20	% Recov

(Sample Complete)

Project: HWD-127A RIDGEFIELD BRICK AND TILE Officer: MLB Account: AGDD3A

Laboratory: EPA, Manchester

Sample No: 91 130159 Description: RB-B6-01 Source: Well (Test/Observation)

Begin Date: 91/03/28 08:30

Metals - Specified		Water-Filtere Result	Units
Arsenic	As-Diss	1.9J*	ug/l
Chromium	Cr-Diss	0.7JB*	ug/l

Metals - Specified Matrix Spike #1		Water-Filtere Result	Units
Arsenic	As-Diss	100	% Recov

Metals - Specified Matrix Spike #2		Water-Filtere Result	Units
Arsenic	As-Diss	102	% Recov

(Sample Complete)

Project: HWD-127A RIDGEFIELD BRICK AND TILE Officer: MLB Account: AGDD3A

Laboratory: EPA, Manchester

Sample No: 91 130160 Description: RB-B20-01 (Trip blank) Source: Well (Test/Observation)

Begin Date: 91/03/27 09:00

VOA - PP Scan (GCMS)	Water-Total Result	Units
Carbon Tetrachloride	1U	ug/l
Acetone	1U	ug/l
Chloroform	0.04J*	ug/l
Benzene	1U	ug/l
1,1,1-Trichloroethane	1U	ug/l
Bromomethane	1U	ug/l
Chloromethane	1U	ug/l
Dibromomethane	1U	ug/l
Bromochloromethane	1U	ug/l
Chloroethane	1U	ug/l
Vinyl Chloride	1U	ug/l
Methylene Chloride	1U	ug/l
Carbon Disulfide	1U	ug/l
Bromoform	1U	ug/l
Bromodichloromethane	1U	ug/l
1,1-Dichloroethane	1U	ug/l
1,1-Dichloroethene	1U	ug/l
Trichlorofluoromethane	1U	ug/l
Methane, Dichlorodiflu+	1U	ug/l
1,2-Dichloropropane	1U	ug/l
2-Butanone	1U	ug/l
1,1,2-Trichloroethane	1U	ug/l
Trichloroethene	1U	ug/l
ETHANE, 1,1,2,2-TETRAC+	1U	ug/l
1,2,3-Trichlorobenzene	1U	ug/l
Hexachlorobutadiene	1U	ug/l
Naphthalene	1U	ug/l
2-Chlorotoluene	1U	ug/l
1,2-Dichlorobenzene	1U	ug/l
1,2,4-Trimethylbenzene	1U	ug/l
1,2-Dibromo-3-chloropr+	1U	ug/l
1,2,3-Trichloropropane	1U	ug/l
Tert-Butylbenzene	1U	ug/l
Isopropylbenzene (Cume+	1U	ug/l
p-Isopropyltoluene	1U	ug/l
Ethylbenzene	1U	ug/l
BENZENE, ETHENYL-(STYR+	1U	ug/l
BENZENE, PROPYL-	1U	ug/l
Butylbenzene	1U	ug/l
4-Chlorotoluene	1U	ug/l
1,4-Dichlorobenzene	1U	ug/l
1,2-Dibromoethane (EDB)	1U	ug/l
1,2-Dichloroethane	1U	ug/l
4-Methyl-2-Pentanone	1U	ug/l
1,3,5-Trimethylbenzene	1U	ug/l

VOA - PP Scan (GCMS) *** Continued ***	Water-Total Result	Units
Bromobenzene	1U	ug/l
Toluene	1U	ug/l
Chlorobenzene	1U	ug/l
1,2,4-Trichlorobenzene	1U	ug/l
Dibromochloromethane	1U	ug/l
Tetrachloroethene	1U	ug/l
Sec-Butylbenzene	1U	ug/l
1,3-Dichloropropane	1U	ug/l
Cis-1,2-Dichloroethene	1U	ug/l
trans-1,2-Dichloroethe+	1U	ug/l
1,3-Dichlorobenzene	1U	ug/l
1,1-Dichloropropene	1U	ug/l
2,2-Dichloropropane	1U	ug/l
2-Hexanone	1U	ug/l
Ethane, 1,1,1,2-Tetrac+	1U	ug/l
Total Xylenes	1U	ug/l
cis-1,3-Dichloropropene	1U	ug/l
trans-1,3-Dichloroprop+	1U	ug/l
p-Bromofluorobenzene	100	% Recov
Surrog: 1-Bromo-2-Fluo+	89	% Recov
d8-Toluene	91	% Recov
d4-1,2-Dichlorobenzene+	NAF	% Recov
1,2-Dichloroethane-d4 +	95	% Recov

(Sample Complete)

Project: HWD-127A RIDGEFIELD BRICK AND TILE Officer: MLB Account: AGDD3A

Laboratory: EPA, Manchester

Sample No: 91 130161 Description: RB-B25-01 (Ambient condition / Field (transfer) blank) Source: Well (Test/Observation)

Begin Date: 91/03/28 12:00

VOA - PP Scan (GCMS)	Water-Total Result	Units
Carbon Tetrachloride	1U	ug/l
Acetone	1U	ug/l
Chloroform	4.6 *	ug/l
Benzene	1U	ug/l
1,1,1-Trichloroethane	1U	ug/l
Bromomethane	1U	ug/l
Chloromethane	1U	ug/l
Dibromomethane	1U	ug/l
Bromochloromethane	1U	ug/l
Chloroethane	1U	ug/l
Vinyl Chloride	1U	ug/l
Methylene Chloride	1U	ug/l
Carbon Disulfide	1U	ug/l
Bromoform	1U	ug/l
Bromodichloromethane	1U	ug/l
1,1-Dichloroethane	1U	ug/l
1,1-Dichloroethene	1U	ug/l
Trichlorofluoromethane	1U	ug/l
Methane, Dichlorodiflu+	1U	ug/l
1,2-Dichloropropane	1U	ug/l
2-Butanone	1U	ug/l
1,1,2-Trichloroethane	1U	ug/l
Trichloroethene	1U	ug/l
ETHANE, 1,1,2,2-TETRAC+	1U	ug/l
1,2,3-Trichlorobenzene	1U	ug/l
Hexachlorobutadiene	1U	ug/l
Naphthalene	1U	ug/l
2-Chlorotoluene	1U	ug/l
1,2-Dichlorobenzene	1U	ug/l
1,2,4-Trimethylbenzene	1U	ug/l
1,2-Dibromo-3-chloropr+	1U	ug/l
1,2,3-Trichloropropane	1U	ug/l
Tert-Butylbenzene	1U	ug/l
Isopropylbenzene (Cume+	1U	ug/l
p-Isopropyltoluene	1U	ug/l
Ethylbenzene	1U	ug/l
BENZENE, ETHENYL-(STYR+	1U	ug/l
BENZENE, PROPYL-	1U	ug/l
Butylbenzene	1U	ug/l
4-Chlorotoluene	1U	ug/l
1,4-Dichlorobenzene	1U	ug/l
1,2-Dibromoethane (EDB)	1U	ug/l
1,2-Dichloroethane	1U	ug/l
4-Methyl-2-Pentanone	1U	ug/l
1,3,5-Trimethylbenzene	1U	ug/l

VOA - PP Scan (GCMS) *** Continued ***	Water-Total Result	Units
Bromobenzene	1U	ug/l
Toluene	1U	ug/l
Chlorobenzene	1U	ug/l
1,2,4-Trichlorobenzene	1U	ug/l
Dibromochloromethane	0.08J*	ug/l
Tetrachloroethene	1U	ug/l
Sec-Butylbenzene	1U	ug/l
1,3-Dichloropropane	1U	ug/l
Cis-1,2-Dichloroethene	1U	ug/l
trans-1,2-Dichloroethe+	1U	ug/l
1,3-Dichlorobenzene	1U	ug/l
1,1-Dichloropropene	1U	ug/l
2,2-Dichloropropane	1U	ug/l
2-Hexanone	1U	ug/l
Ethane, 1,1,1,2-Tetrac+	1U	ug/l
Total Xylenes	1U	ug/l
cis-1,3-Dichloropropene	1U	ug/l
trans-1,3-Dichloroprop+	1U	ug/l
p-Bromofluorobenzene	90	% Recov
Surrog: 1-Bromo-2-Fluo+	97	% Recov
d8-Toluene	90	% Recov
d4-1,2-Dichlorobenzene+	NAF	% Recov
1,2-Dichloroethane-d4 +	88	% Recov

(Sample Complete)

Project: HWD-127A RIDGEFIELD BRICK AND TILE Officer: MLB Account: AGDD3A

Laboratory: EPA, Manchester

Sample No: 91 130162 Description: RB-TD1-01 (Toe Drain 1) Source: Well (Test/Observation)

from water standing in toe drain

Begin Date: 91/03/28 09:45

Metals - Specified	Water-Total Result	Units
Arsenic As-Total	1.5U	ug/l
Chromium Cr-Total	1.1B*	ug/l

VOA - PP Scan (GCMS)	Water-Total Result	Units
Carbon Tetrachloride	1U	ug/l
Acetone	1U	ug/l
Chloroform	1U	ug/l
Benzene	1U	ug/l
1,1,1-Trichloroethane	1U	ug/l
Bromomethane	1U	ug/l
Chloromethane	1U	ug/l
Dibromomethane	1U	ug/l
Bromochloromethane	1U	ug/l
Chloroethane	0.1J*	ug/l
Vinyl Chloride	1U	ug/l
Methylene Chloride	1U	ug/l
Carbon Disulfide	1U	ug/l
Bromoform	1U	ug/l
Bromodichloromethane	1U	ug/l
1,1-Dichloroethane	0.2J*	ug/l
1,1-Dichloroethene	1U	ug/l
Trichlorofluoromethane	1U	ug/l
Methane, Dichlorodiflu+	1U	ug/l
1,2-Dichloropropane	1U	ug/l
2-Butanone	1.5U	ug/l
1,1,2-Trichloroethane	1U	ug/l
Trichloroethene	1U	ug/l
ETHANE, 1,1,2,2-TETRAC+	1U	ug/l
1,2,3-Trichlorobenzene	1U	ug/l
Hexachlorobutadiene	1U	ug/l
Naphthalene	1U	ug/l
2-Chlorotoluene	1U	ug/l
1,2-Dichlorobenzene	1U	ug/l
1,2,4-Trimethylbenzene	1U	ug/l
1,2-Dibromo-3-chloropr+	1U	ug/l
1,2,3-Trichloropropane	1U	ug/l
Tert-Butylbenzene	1U	ug/l
Isopropylbenzene (Cume+	1U	ug/l
p-Isopropyltoluene	1U	ug/l
Ethylbenzene	1U	ug/l
BENZENE, ETHENYL-(STYR+	1U	ug/l
BENZENE, PROPYL-	1U	ug/l

VOA - PP Scan (GCMS) *** Continued	Water-Total Result	Units
Butylbenzene	1U	ug/l
4-Chlorotoluene	1U	ug/l
1,4-Dichlorobenzene	1U	ug/l
1,2-Dibromoethane (EDB)	1U	ug/l
1,2-Dichloroethane	1.4 *	ug/l
4-Methyl-2-Pentanone	1U	ug/l
1,3,5-Trimethylbenzene	1U	ug/l
Bromobenzene	1U	ug/l
Toluene	1U	ug/l
Chlorobenzene	1U	ug/l
1,2,4-Trichlorobenzene	1U	ug/l
Dibromochloromethane	1U	ug/l
Tetrachloroethene	1U	ug/l
Sec-Butylbenzene	1U	ug/l
1,3-Dichloropropane	1U	ug/l
Cis-1,2-Dichloroethene	1U	ug/l
trans-1,2-Dichloroethe+	1U	ug/l
1,3-Dichlorobenzene	1U	ug/l
1,1-Dichloropropene	1U	ug/l
2,2-Dichloropropane	1U	ug/l
2-Hexanone	1U	ug/l
Ethane, 1,1,1,2-Tetrac+	1U	ug/l
Total Xylenes	1U	ug/l
cis-1,3-Dichloropropene	1U	ug/l
trans-1,3-Dichloroprop+	1U	ug/l
p-Bromofluorobenzene	93	% Recov
Surrog: 1-Bromo-2-Fluo+	111	% Recov
d8-Toluene	92	% Recov
1,2-Dichloroethane-d4 +	104	% Recov

B/N/Acid Scan	Water-Total Result	Units
Benzo(a)pyrene	0.06UJ	ug/l
2,4-Dinitrophenol	0.6UJ	ug/l
Dibenzo(a,h)anthracene	0.06UJ	ug/l
Benzo(a)anthracene	0.06UJ	ug/l
4-Chloro-3-Methylphenol	0.06UJ	ug/l
Acenaphthene	0.6J*	ug/l
Phenanthrene	0.1J*	ug/l
Fluorene	0.2J*	ug/l
Carbazole	0.2J*	ug/l
Pentachlorophenol	1J*	ug/l

B/N/Acid Scan *** Continued	Water-Total Result	Units
2,4,6-Trichlorophenol	0.06UJ	ug/l
2-Nitrophenol	0.06UJ	ug/l
Naphthalene, 1-Methyl-	0.1J*	ug/l
Naphthalene	0.4J*	ug/l
2-Methylnaphthalene	0.02J*	ug/l
2-Chloronaphthalene	0.06UJ	ug/l
2-Methylphenol	0.005J*	ug/l
o-Chlorophenol	0.06UJ	ug/l
2,4,5-Trichlorophenol	0.06UJ	ug/l
4-Nitrophenol	0.6UJ	ug/l
2,4-Dimethylphenol	0.06UJ	ug/l
4-Methylphenol	0.01J*	ug/l
Phenol	0.2UJ	ug/l
Anthracene	0.04J*	ug/l
2,4-Dichlorophenol	0.06UJ	ug/l
Pyrene	0.08J*	ug/l
Dibenzofuran	0.2J*	ug/l
Benzo(ghi)perylene	0.06UJ	ug/l
Indeno(1,2,3-cd)pyrene	0.06UJ	ug/l
Benzo(b)fluoranthene	0.06UJ	ug/l
Fluoranthene	0.08J*	ug/l
Benzo(k)fluoranthene	0.06UJ	ug/l
Acenaphthylene	0.02J*	ug/l
Chrysene	0.06UJ	ug/l
Retene	0.06UJ	ug/l
4,6-Dinitro-2-methylph+	0.6UJ	ug/l
Surrog: 2,4,6-Tribromo+	NAR	% Recov
Surrog: 2-Fluorobiphen+	59	% Recov
Surrog: 2-Fluorophenol	38	% Recov
Surrog: D14-Terphenyl	73	% Recov
PYRENE-D10 (SS)	77	% Recov
Surrog: D5-Nitrobenzene	57	% Recov
Surrog: D5-Phenol	21	% Recov

(Sample Complete)

Project: HWD-127A RIDGEFIELD BRICK AND TILE Officer: MLB Account: AGDD3A

Laboratory: EPA, Manchester

Sample No: 91 130163 Description: RB-TD1-01 Source: Well (Test/Observation)

Begin Date: 91/03/28 10:00

Metals - Specified		Water-Filtere Result	Units
Arsenic	As-Diss	1.5U	ug/l
Chromium	Cr-Diss	0.4JB*	ug/l

(Sample Complete)

Project: HWD-127A RIDGEFIELD BRICK AND TILE Officer: MLB Account: AGDD3A

Laboratory: EPA, Manchester

Sample No: 91 130164 Description: RB-TD2-01 (Tie Drain 2) From Inlet Source: Well (Test/Observation)

Begin Date: 91/03/28 10:40

Metals - Specified	Water-Total Result	Units
Arsenic As-Total	1.5U	ug/l
Chromium Cr-Total	1.9 *	ug/l

VOA - PP Scan (GCMS)	Water-Total Result	Units
Carbon Tetrachloride	1U	ug/l
Acetone	1U	ug/l
Chloroform	1U	ug/l
Benzene	1U	ug/l
1,1,1-Trichloroethane	1U	ug/l
Bromomethane	1U	ug/l
Chloromethane	1U	ug/l
Dibromomethane	1U	ug/l
Bromochloromethane	1U	ug/l
Chloroethane	1U	ug/l
Vinyl Chloride	1U	ug/l
Methylene Chloride	1U	ug/l
Carbon Disulfide	1U	ug/l
Bromoform	1U	ug/l
Bromodichloromethane	1U	ug/l
1,1-Dichloroethane	1U	ug/l
1,1-Dichloroethene	1U	ug/l
Trichlorofluoromethane	1U	ug/l
Methane, Dichlorodiflu+	1U	ug/l
1,2-Dichloropropane	1U	ug/l
2-Butanone	1.2U	ug/l
1,1,2-Trichloroethane	1U	ug/l
Trichloroethene	1U	ug/l
ETHANE, 1,1,2,2-TETRAC+	1U	ug/l
1,2,3-Trichlorobenzene	1U	ug/l
Hexachlorobutadiene	1U	ug/l
Naphthalene	1U	ug/l
2-Chlorotoluene	1U	ug/l
1,2-Dichlorobenzene	1U	ug/l
1,2,4-Trimethylbenzene	1U	ug/l
1,2-Dibromo-3-chloropr+	1U	ug/l
1,2,3-Trichloropropane	1U	ug/l
Tert-Butylbenzene	1U	ug/l
Isopropylbenzene (Cume+	1U	ug/l
p-Isopropyltoluene	1U	ug/l
Ethylbenzene	1U	ug/l
BENZENE, ETHENYL-(STYR+	1U	ug/l
BENZENE, PROPYL-	1U	ug/l

VOA - PP Scan (GCMS) *** Continued ***	Water-Total Result	Units
Butylbenzene	1U	ug/l
4-Chlorotoluene	1U	ug/l
1,4-Dichlorobenzene	1U	ug/l
1,2-Dibromoethane (EDB)	1U	ug/l
1,2-Dichloroethane	0.4J*	ug/l
4-Methyl-2-Pentanone	1U	ug/l
1,3,5-Trimethylbenzene	1U	ug/l
Bromobenzene	1U	ug/l
Toluene	1U	ug/l
Chlorobenzene	1U	ug/l
1,2,4-Trichlorobenzene	1U	ug/l
Dibromochloromethane	1U	ug/l
Tetrachloroethene	1U	ug/l
Sec-Butylbenzene	1U	ug/l
1,3-Dichloropropane	1U	ug/l
Cis-1,2-Dichloroethene	1U	ug/l
trans-1,2-Dichloroethe+	1U	ug/l
1,3-Dichlorobenzene	1U	ug/l
1,1-Dichloropropene	1U	ug/l
2,2-Dichloropropane	1U	ug/l
2-Hexanone	1U	ug/l
Ethane, 1,1,1,2-Tetrac+	1U	ug/l
Total Xylenes	1U	ug/l
cis-1,3-Dichloropropene	1U	ug/l
trans-1,3-Dichloroprop+	1U	ug/l
p-Bromofluorobenzene	91	% Recov
Surrog: 1-Bromo-2-Fluo+	107	% Recov
d8-Toluene	91	% Recov
d4-1,2-Dichlorobenzene+	NAF	% Recov
1,2-Dichloroethane-d4 +	96	% Recov

B/N/Acid Scan	Water-Total Result	Units
Benzo(a)pyrene	0.07UJ	ug/l
2,4-Dinitrophenol	0.7UJ	ug/l
Dibenzo(a,h)anthracene	0.07UJ	ug/l
Benzo(a)anthracene	0.07UJ	ug/l
4-Chloro-3-Methylphenol	0.07UJ	ug/l
Acenaphthene	0.2J*	ug/l
Phenanthrene	0.05J*	ug/l
Fluorene	0.1J*	ug/l
Carbazole	0.05J*	ug/l

B/N/Acid Scan *** Continued ***	Water-Total Result	Units
Pentachlorophenol	0.7J*	ug/l
2,4,6-Trichlorophenol	0.07UJ	ug/l
2-Nitrophenol	0.07UJ	ug/l
Naphthalene, 1-Methyl-	0.05J*	ug/l
Naphthalene	0.2J*	ug/l
2-Methylnaphthalene	0.004J*	ug/l
2-Chloronaphthalene	0.07UJ	ug/l
2-Methylphenol	0.002J*	ug/l
o-Chlorophenol	0.07UJ	ug/l
2,4,5-Trichlorophenol	0.07UJ	ug/l
4-Nitrophenol	0.7UJ	ug/l
2,4-Dimethylphenol	0.07UJ	ug/l
4-Methylphenol	0.02J*	ug/l
Phenol	0.07UJ	ug/l
Anthracene	0.02J*	ug/l
2,4-Dichlorophenol	0.07UJ	ug/l
Pyrene	0.02J*	ug/l
Dibenzofuran	0.06J*	ug/l
Benzo(ghi)perylene	0.07UJ	ug/l
Indeno(1,2,3-cd)pyrene	0.07UJ	ug/l
Benzo(b)fluoranthene	0.07UJ	ug/l
Fluoranthene	0.03J*	ug/l
Benzo(k)fluoranthene	0.07UJ	ug/l
Acenaphthylene	0.007J*	ug/l
Chrysene	0.07UJ	ug/l
Retene	0.07UJ	ug/l
4,6-Dinitro-2-methylph+	0.7UJ	ug/l
Surrog: 2,4,6-Tribromo+	NAR	% Recov
Surrog: 2-Fluorobiphen+	49	% Recov
Surrog: 2-Fluorophenol	33	% Recov
Surrog: D14-Terphenyl	79	% Recov
PYRENE-D10 (SS)	82	% Recov
Surrog: D5-Nitrobenzene	53	% Recov
Surrog: D5-Phenol	19	% Recov

(Sample Complete)

Project: HWD-127A RIDGEFIELD BRICK AND TILE Officer: MLB Account: AGDD3A

Laboratory: EPA, Manchester

Sample No: 91 130165 Description: RB-TD2-01 Source: Well (Test/Observation)

Begin Date: 91/03/28 11:05

Metals - Specified		Water-Filtere Result	Units
Arsenic	As-Diss	1.5U	ug/l
Chromium	Cr-Diss	0.9JB*	ug/l

(Sample Complete)

Project: HWD-127A RIDGEFIELD BRICK AND TILE — Officer: MLB — Account: AGDD3A

Laboratory: EPA, Manchester

Sample No: 91 130166 — Description: RB-TD10-01 (Duplicate of TD-1) — Source: Well (Test/Observation)

Begin Date: 91/03/28 09:55

Metals - Specified	Water-Total Result	Units
Arsenic As-Total	1.5U	ug/l
Chromium Cr-Total	1.4B*	ug/l

VOA - PP Scan (GCMS)	Water-Total Result	Units
Carbon Tetrachloride	1U	ug/l
Acetone	1U	ug/l
Chloroform	1U	ug/l
Benzene	1U	ug/l
1,1,1-Trichloroethane	1U	ug/l
Bromomethane	1U	ug/l
Chloromethane	1U	ug/l
Dibromomethane	1U	ug/l
Bromochloromethane	1U	ug/l
Chloroethane	0.1J*	ug/l
Vinyl Chloride	1U	ug/l
Methylene Chloride	1U	ug/l
Carbon Disulfide	1U	ug/l
Bromoform	1U	ug/l
Bromodichloromethane	1U	ug/l
1,1-Dichloroethane	1U	ug/l
1,1-Dichloroethene	1U	ug/l
Trichlorofluoromethane	1U	ug/l
Methane, Dichlorodiflu+	1U	ug/l
1,2-Dichloropropane	1U	ug/l
2-Butanone	1U	ug/l
1,1,2-Trichloroethane	1U	ug/l
Trichloroethene	1U	ug/l
ETHANE, 1,1,2,2-TETRAC+	1U	ug/l
1,2,3-Trichlorobenzene	1U	ug/l
Hexachlorobutadiene	1U	ug/l
Naphthalene	1U	ug/l
2-Chlorotoluene	1U	ug/l
1,2-Dichlorobenzene	1U	ug/l
1,2,4-Trimethylbenzene	1U	ug/l
1,2-Dibromo-3-chloropr+	1U	ug/l
1,2,3-Trichloropropane	1U	ug/l
Tert-Butylbenzene	1U	ug/l
Isopropylbenzene (Cume+	1U	ug/l
p-Isopropyltoluene	1U	ug/l
Ethylbenzene	1U	ug/l
BENZENE, ETHENYL-(STYR+	1U	ug/l
BENZENE, PROPYL-	1U	ug/l

VOA - PP Scan (GCMS) *** Continued ***	Water-Total Result	Units
Butylbenzene	1U	ug/l
4-Chlorotoluene	1U	ug/l
1,4-Dichlorobenzene	1U	ug/l
1,2-Dibromoethane (EDB)	1U	ug/l
1,2-Dichloroethane	0.4J*	ug/l
4-Methyl-2-Pentanone	1U	ug/l
1,3,5-Trimethylbenzene	1U	ug/l
Bromobenzene	1U	ug/l
Toluene	1U	ug/l
Chlorobenzene	1U	ug/l
1,2,4-Trichlorobenzene	1U	ug/l
Dibromochloromethane	1U	ug/l
Tetrachloroethene	1U	ug/l
Sec-Butylbenzene	1U	ug/l
1,3-Dichloropropane	1U	ug/l
Cis-1,2-Dichloroethene	1U	ug/l
trans-1,2-Dichloroethe+	1U	ug/l
1,3-Dichlorobenzene	1U	ug/l
1,1-Dichloropropene	1U	ug/l
2,2-Dichloropropane	1U	ug/l
2-Hexanone	1U	ug/l
Ethane, 1,1,1,2-Tetrac+	1U	ug/l
Total Xylenes	1U	ug/l
cis-1,3-Dichloropropene	1U	ug/l
trans-1,3-Dichloroprop+	1U	ug/l
p-Bromofluorobenzene	94	% Recov
Surrog: 1-Bromo-2-Fluo+	107	% Recov
d8-Toluene	91	% Recov
d4-1,2-Dichlorobenzene+	NAF	% Recov
1,2-Dichloroethane-d4 +	96	% Recov

B/N/Acid Scan	Water-Total Result	Units
Benzo(a)pyrene	0.06UJ	ug/l
2,4-Dinitrophenol	0.6UJ	ug/l
Dibenzo(a,h)anthracene	0.06UJ	ug/l
Benzo(a)anthracene	0.06UJ	ug/l
4-Chloro-3-Methylphenol	0.06UJ	ug/l
Acenaphthene	0.6J*	ug/l
Phenanthrene	0.1J*	ug/l
Fluorene	0.2J*	ug/l
Carbazole	0.1J*	ug/l

B/N/Acid Scan *** Continued ***	Water-Total Result	Units
Pentachlorophenol	1J*	ug/l
2,4,6-Trichlorophenol	0.06UJ	ug/l
2-Nitrophenol	0.06UJ	ug/l
Naphthalene, 1-Methyl-	0.1J*	ug/l
Naphthalene	0.4J*	ug/l
2-Methylnaphthalene	0.01J*	ug/l
2-Chloronaphthalene	0.06UJ	ug/l
2-Methylphenol	0.002J*	ug/l
o-Chlorophenol	0.06UJ	ug/l
2,4,5-Trichlorophenol	0.06UJ	ug/l
4-Nitrophenol	0.6UJ	ug/l
2,4-Dimethylphenol	0.06UJ	ug/l
4-Methylphenol	0.006J*	ug/l
Phenol	0.06UJ	ug/l
Anthracene	0.04J*	ug/l
2,4-Dichlorophenol	0.06UJ	ug/l
Pyrene	0.09J*	ug/l
Dibenzofuran	0.2J*	ug/l
Benzo(ghi)perylene	0.06UJ	ug/l
Indeno(1,2,3-cd)pyrene	0.06UJ	ug/l
Benzo(b)fluoranthene	0.06UJ	ug/l
Fluoranthene	0.08J*	ug/l
Benzo(k)fluoranthene	0.06UJ	ug/l
Acenaphthylene	0.01J*	ug/l
Chrysene	0.06UJ	ug/l
Retene	0.06UJ	ug/l
4,6-Dinitro-2-methylph+	0.6UJ	ug/l
Surrog: 2,4,6-Tribromo+	NAR	% Recov
Surrog: 2-Fluorobiphen+	52	% Recov
Surrog: 2-Fluorophenol	37	% Recov
Surrog: D14-Terphenyl	85	% Recov
PYRENE-D10 (SS)	88	% Recov
Surrog: D5-Nitrobenzene	57	% Recov
Surrog: D5-Phenol	22	% Recov

(Sample Complete)

Project: HWD-127A RIDGEFIELD BRICK AND TILE Officer: MLB Account: AGDD3A

Laboratory: EPA, Manchester

Sample No: 91 130167 Description: RB-TD10-01 (Duplicate of TD-1) Source: Well (Test/Observation)

Begin Date: 91/03/28 10:20

Metals - Specified		Water-Filtere Result	Units
Arsenic	As-Diss	1.5U	ug/l
Chromium	Cr-Diss	0.3JB*	ug/l

(Sample Complete)

Project: HWD-127A RIDGEFIELD BRICK AND TILE Officer: MLB Account: AGDD3A

Laboratory: EPA, Manchester

Sample No: 91 130168 Description: RB-TD15-01 (Equipment Rinsate Blank) Source: Well (Test/Observation)

Begin Date: 91/03/28 11:25

Metals - Specified	Water-Total Result	Units
Arsenic As-Total	1.5U	ug/l
Chromium Cr-Total	1.5B*	ug/l

VOA - PP Scan (GCMS)	Water-Total Result	Units
Carbon Tetrachloride	1U	ug/l
Acetone	8.5U	ug/l
Chloroform	1U	ug/l
Benzene	1U	ug/l
1,1,1-Trichloroethane	1U	ug/l
Bromomethane	1U	ug/l
Chloromethane	1U	ug/l
Dibromomethane	1U	ug/l
Bromochloromethane	1U	ug/l
Chloroethane	1U	ug/l
Vinyl Chloride	1U	ug/l
Methylene Chloride	1U	ug/l
Carbon Disulfide	1U	ug/l
Bromoform	1U	ug/l
Bromodichloromethane	1U	ug/l
1,1-Dichloroethane	1U	ug/l
1,1-Dichloroethene	1U	ug/l
Trichlorofluoromethane	1U	ug/l
Methane, Dichlorodiflu+	1U	ug/l
1,2-Dichloropropane	1U	ug/l
2-Butanone	2.9U	ug/l
1,1,2-Trichloroethane	1U	ug/l
Trichloroethene	1U	ug/l
ETHANE, 1,1,2,2-TETRAC+	1U	ug/l
1,2,3-Trichlorobenzene	1U	ug/l
Hexachlorobutadiene	1U	ug/l
Naphthalene	1U	ug/l
2-Chlorotoluene	1U	ug/l
1,2-Dichlorobenzene	1U	ug/l
1,2,4-Trimethylbenzene	1U	ug/l
1,2-Dibromo-3-chloropr+	1U	ug/l
1,2,3-Trichloropropane	1U	ug/l
Tert-Butylbenzene	1U	ug/l
Isopropylbenzene (Cume+	1U	ug/l
p-Isopropyltoluene	1U	ug/l
Ethylbenzene	1U	ug/l
BENZENE, ETHENYL-(STYR+	1U	ug/l
BENZENE, PROPYL-	1U	ug/l

VOA - PP Scan (GCMS) *** Continued ***	Water-Total Result	Units
Butylbenzene	1U	ug/l
4-Chlorotoluene	1U	ug/l
1,4-Dichlorobenzene	1U	ug/l
1,2-Dibromoethane (EDB)	1U	ug/l
1,2-Dichloroethane	0.6J*	ug/l
4-Methyl-2-Pentanone	1U	ug/l
1,3,5-Trimethylbenzene	1U	ug/l
Bromobenzene	1U	ug/l
Toluene	0.5J*	ug/l
Chlorobenzene	1U	ug/l
1,2,4-Trichlorobenzene	1U	ug/l
Dibromochloromethane	1U	ug/l
Tetrachloroethene	1U	ug/l
Sec-Butylbenzene	1U	ug/l
1,3-Dichloropropane	1U	ug/l
Cis-1,2-Dichloroethene	1U	ug/l
trans-1,2-Dichloroethe+	1U	ug/l
1,3-Dichlorobenzene	1U	ug/l
1,1-Dichloropropene	1U	ug/l
2,2-Dichloropropane	1U	ug/l
2-Hexanone	1U	ug/l
Ethane, 1,1,1,2-Tetrac+	1U	ug/l
Total Xylenes	1U	ug/l
cis-1,3-Dichloropropene	1U	ug/l
trans-1,3-Dichloroprop+	1U	ug/l
p-Bromofluorobenzene	93	% Recov
Surrog: 1-Bromo-2-Fluo+	108	% Recov
d8-Toluene	93	% Recov
d4-1,2-Dichlorobenzene+	NAF	% Recov
1,2-Dichloroethane-d4 +	96	% Recov

B/N/Acid Scan	Water-Total Result	Units
Benzo(a)pyrene	0.06UJ	ug/l
2,4-Dinitrophenol	0.6UJ	ug/l
Dibenzo(a,h)anthracene	0.06UJ	ug/l
Benzo(a)anthracene	0.06UJ	ug/l
4-Chloro-3-Methylphenol	0.06UJ	ug/l
Acenaphthene	0.06UJ	ug/l
Phenanthrene	0.06UJ	ug/l
Fluorene	0.06UJ	ug/l
Carbazole	0.06UJ	ug/l

B/N/Acid Scan *** Continued ***	Water-Total Result	Units
Pentachlorophenol	0.6UJ	ug/l
2,4,6-Trichlorophenol	0.06UJ	ug/l
2-Nitrophenol	0.06UJ	ug/l
Naphthalene, 1-Methyl-	0.06UJ	ug/l
Naphthalene	0.06UJ	ug/l
2-Methylnaphthalene	0.06UJ	ug/l
2-Chloronaphthalene	0.06UJ	ug/l
2-Methylphenol	0.06UJ	ug/l
o-Chlorophenol	0.06UJ	ug/l
2,4,5-Trichlorophenol	0.06UJ	ug/l
4-Nitrophenol	0.6UJ	ug/l
2,4-Dimethylphenol	0.06UJ	ug/l
4-Methylphenol	0.06UJ	ug/l
Phenol	0.1UJ	ug/l
Anthracene	0.06UJ	ug/l
2,4-Dichlorophenol	0.06UJ	ug/l
Pyrene	0.06UJ	ug/l
Dibenzofuran	0.06UJ	ug/l
Benzo(ghi)perylene	0.06UJ	ug/l
Indeno(1,2,3-cd)pyrene	0.06UJ	ug/l
Benzo(b)fluoranthene	0.06UJ	ug/l
Fluoranthene	0.06UJ	ug/l
Benzo(k)fluoranthene	0.06UJ	ug/l
Acenaphthylene	0.06UJ	ug/l
Chrysene	0.06UJ	ug/l
Retene	0.06UJ	ug/l
4,6-Dinitro-2-methylph+	0.6UJ	ug/l
Surrog: 2,4,6-Tribromo+	NAR	% Recov
Surrog: 2-Fluorobiphen+	57	% Recov
Surrog: 2-Fluorophenol	36	% Recov
Surrog: D14-Terphenyl	81	% Recov
PYRENE-D10 (SS)	82	% Recov
Surrog: D5-Nitrobenzene	58	% Recov
Surrog: D5-Phenol	20	% Recov

(Sample Complete)

Project: HWD-127A RIDGEFIELD BRICK AND TILE Officer: MLB Account: AGDD3A

Laboratory: EPA, Manchester

Sample No: 91 130169 Description: RB-TD15-01 (Equipment Rinsate Blank) Source: Well (Test/Observation)

Begin Date: 91/03/28 11:40

Metals - Specified		Water-Filtere Result	Units
Arsenic	As-Diss	1.5U	ug/l
Chromium	Cr-Diss	1.3JB*	ug/l

(Sample Complete)

Project: HWD-127A RIDGEFIELD BRICK AND TILE Officer: MLB Account: AGDD3A

Blank ID: BW1093

B/N/Acid Scan Blank #1	Water-Total Result	Units
Benzo(a)pyrene	0.07UJ	ug/l
2,4-Dinitrophenol	0.7UJ	ug/l
Dibenzo(a,h)anthracene	0.07UJ	ug/l
Benzo(a)anthracene	0.07UJ	ug/l
4-Chloro-3-Methylphenol	0.07UJ	ug/l
Acenaphthene	0.07UJ	ug/l
Phenanthrene	0.07UJ	ug/l
Fluorene	0.07UJ	ug/l
Carbazole	0.07UJ	ug/l
Pentachlorophenol	0.7UJ	ug/l
2,4,6-Trichlorophenol	0.07UJ	ug/l
2-Nitrophenol	0.07UJ	ug/l
Naphthalene, 1-Methyl-	0.07UJ	ug/l
Naphthalene	0.005J*	ug/l
2-Methylnaphthalene	0.07UJ	ug/l
2-Chloronaphthalene	0.07UJ	ug/l
2-Methylphenol	0.07UJ	ug/l
o-Chlorophenol	0.07UJ	ug/l
2,4,5-Trichlorophenol	0.07UJ	ug/l
4-Nitrophenol	0.7UJ	ug/l
2,4-Dimethylphenol	0.07UJ	ug/l
4-Methylphenol	0.07UJ	ug/l
Phenol	0.06J*	ug/l
Anthracene	0.07UJ	ug/l
2,4-Dichlorophenol	0.07UJ	ug/l
Pyrene	0.07UJ	ug/l
Dibenzofuran	0.07UJ	ug/l
Benzo(ghi)perylene	0.07UJ	ug/l
Indeno(1,2,3-cd)pyrene	0.07UJ	ug/l
Benzo(b)fluoranthene	0.07UJ	ug/l
Fluoranthene	0.07UJ	ug/l
Benzo(k)fluoranthene	0.07UJ	ug/l
Acenaphthylene	0.07UJ	ug/l
Chrysene	0.07UJ	ug/l
Retene	0.07UJ	ug/l
4,6-Dinitro-2-methylph+	0.7UJ	ug/l
Surrog: 2,4,6-Tribromo+	NAR	% Recov
Surrog: 2-Fluorobiphen+	54	% Recov
Surrog: 2-Fluorophenol	47	% Recov
Surrog: D14-Terphenyl	98	% Recov
PYRENE-D10 (SS)	100	% Recov
Surrog: D5-Nitrobenzene	60	% Recov
Surrog: D5-Phenol	31	% Recov

(Sample Complete)

Project: HWD-127A RIDGEFIELD BRICK AND TILE Officer: MLB Account: AGDD3A

Blank ID: BW1093D

B/N/Acid Scan Blank #2	Water-Total Result	Units
Benzo(a)pyrene	0.07UJ	ug/l
2,4-Dinitrophenol	0.7UJ	ug/l
Dibenzo(a,h)anthracene	0.07UJ	ug/l
Benzo(a)anthracene	0.07UJ	ug/l
4-Chloro-3-Methylphenol	0.07UJ	ug/l
Acenaphthene	0.07UJ	ug/l
Phenanthrene	0.07UJ	ug/l
Fluorene	0.07UJ	ug/l
Carbazole	0.07UJ	ug/l
Pentachlorophenol	0.7UJ	ug/l
2,4,6-Trichlorophenol	0.07UJ	ug/l
2-Nitrophenol	0.07UJ	ug/l
Naphthalene, 1-Methyl-	0.07UJ	ug/l
Naphthalene	0.004J*	ug/l
2-Methylnaphthalene	0.07UJ	ug/l
2-Chloronaphthalene	0.07UJ	ug/l
2-Methylphenol	0.07UJ	ug/l
o-Chlorophenol	0.07UJ	ug/l
2,4,5-Trichlorophenol	0.07UJ	ug/l
4-Nitrophenol	0.7UJ	ug/l
2,4-Dimethylphenol	0.07UJ	ug/l
4-Methylphenol	0.07UJ	ug/l
Phenol	0.05J*	ug/l
Anthracene	0.07UJ	ug/l
2,4-Dichlorophenol	0.07UJ	ug/l
Pyrene	0.07UJ	ug/l
Dibenzofuran	0.07UJ	ug/l
Benzo(ghi)perylene	0.07UJ	ug/l
Indeno(1,2,3-cd)pyrene	0.07UJ	ug/l
Benzo(b)fluoranthene	0.07UJ	ug/l
Fluoranthene	0.07UJ	ug/l
Benzo(k)fluoranthene	0.07UJ	ug/l
Acenaphthylene	0.07UJ	ug/l
Chrysene	0.07UJ	ug/l
Retene	0.07UJ	ug/l
4,6-Dinitro-2-methylph+	0.7UJ	ug/l
Surrog: 2,4,6-Tribromo+	NAR	% Recov
Surrog: 2-Fluorobiphen+	49	% Recov
Surrog: 2-Fluorophenol	42	% Recov
Surrog: D14-Terphenyl	88	% Recov
PYRENE-D10 (SS)	90	% Recov
Surrog: D5-Nitrobenzene	58	% Recov
Surrog: D5-Phenol	28	% Recov

(Sample Complete)

Project: HWD-127A RIDGEFIELD BRICK AND TILE Officer: MLB Account: AGDD3A

Blank ID: BW1099

VOA - PP Scan (GCMS) Blank #1	Water-Total Result	Units
Carbon Tetrachloride	1U	ug/l
Acetone	4.8 *	ug/l
Chloroform	1U	ug/l
Benzene	0.03J*	ug/l
1,1,1-Trichloroethane	1U	ug/l
Bromomethane	1U	ug/l
Chloromethane	1U	ug/l
Dibromomethane	1U	ug/l
Bromochloromethane	1U	ug/l
Chloroethane	1U	ug/l
Vinyl Chloride	1U	ug/l
Methylene Chloride	0.7J*	ug/l
Carbon Disulfide	1U	ug/l
Bromoform	1U	ug/l
Bromodichloromethane	1U	ug/l
1,1-Dichloroethane	1U	ug/l
1,1-Dichloroethene	1U	ug/l
Trichlorofluoromethane	1U	ug/l
Methane, Dichlorodiflu+	1U	ug/l
1,2-Dichloropropane	1U	ug/l
?-Butanone	0.6J*	ug/l
.,1,2-Trichloroethane	1U	ug/l
Trichloroethene	1U	ug/l
ETHANE, 1,1,2,2-TETRAC+	1U	ug/l
1,2,3-Trichlorobenzene	0.07J*	ug/l
Hexachlorobutadiene	1U	ug/l
Naphthalene	1U	ug/l
2-Chlorotoluene	1U	ug/l
1,2-Dichlorobenzene	1U	ug/l
1,2,4-Trimethylbenzene	1U	ug/l
1,2-Dibromo-3-chloropr+	1U	ug/l
1,2,3-Trichloropropane	1U	ug/l
Tert-Butylbenzene	1U	ug/l
Isopropylbenzene (Cume+	1U	ug/l
p-Isopropyltoluene	1U	ug/l
Ethylbenzene	1U	ug/l
BENZENE, ETHENYL-(STYR+	1U	ug/l
BENZENE, PROPYL-	1U	ug/l
Butylbenzene	1U	ug/l
4-Chlorotoluene	1U	ug/l
1,4-Dichlorobenzene	1U	ug/l
1,2-Dibromoethane (EDB)	1U	ug/l
1,2-Dichloroethane	1U	ug/l
4-Methyl-2-Pentanone	1U	ug/l
1,3,5-Trimethylbenzene	1U	ug/l

VOA - PP Scan (GCMS) *** Continued *** Blank #1	Water-Total Result	Units
Bromobenzene	1U	ug/l
Toluene	1U	ug/l
Chlorobenzene	1U	ug/l
1,2,4-Trichlorobenzene	0.06J*	ug/l
Dibromochloromethane	1U	ug/l
Tetrachloroethene	1U	ug/l
Sec-Butylbenzene	1U	ug/l
1,3-Dichloropropane	1U	ug/l
Cis-1,2-Dichloroethene	1U	ug/l
trans-1,2-Dichloroethe+	1U	ug/l
1,3-Dichlorobenzene	0.03J*	ug/l
1,1-Dichloropropene	1U	ug/l
2,2-Dichloropropane	1U	ug/l
2-Hexanone	1U	ug/l
Ethane, 1,1,1,2-Tetrac+	1U	ug/l
Total Xylenes	0.02J*	ug/l
cis-1,3-Dichloropropene	1U	ug/l
trans-1,3-Dichloroprop+	1U	ug/l
p-Bromofluorobenzene	101	% Recov
Surrog: 1-Bromo-2-Fluo+	92	% Recov
d8-Toluene	96	% Recov
d4-1,2-Dichlorobenzene+	NAF	% Recov
1,2-Dichloroethane-d4 +	97	% Recov

(Sample Complete)

Project: HWD-127A RIDGEFIELD BRICK AND TILE Officer: MLB Account: AGDD3A

Blank ID: BW1100

VOA - PP Scan (GCMS) Blank #2	Water-Total Result	Units
Carbon Tetrachloride	1U	ug/l
Acetone	3.8 *	ug/l
Chloroform	1U	ug/l
Benzene	1U	ug/l
1,1,1-Trichloroethane	1U	ug/l
Bromomethane	1U	ug/l
Chloromethane	1U	ug/l
Dibromomethane	1U	ug/l
Bromochloromethane	1U	ug/l
Chloroethane	1U	ug/l
Vinyl Chloride	1U	ug/l
Methylene Chloride	5.6 *	ug/l
Carbon Disulfide	0.1J*	ug/l
Bromoform	1U	ug/l
Bromodichloromethane	1U	ug/l
1,1-Dichloroethane	1U	ug/l
1,1-Dichloroethene	1U	ug/l
Trichlorofluoromethane	1U	ug/l
Methane, Dichlorodiflu+	1U	ug/l
1,2-Dichloropropane	1U	ug/l
2-Butanone	0.9J*	ug/l
1,1,2-Trichloroethane	1U	ug/l
Trichloroethene	1U	ug/l
ETHANE, 1,1,2,2-TETRAC+	1U	ug/l
1,2,3-Trichlorobenzene	0.07J*	ug/l
Hexachlorobutadiene	1U	ug/l
Naphthalene	1U	ug/l
2-Chlorotoluene	1U	ug/l
1,2-Dichlorobenzene	0.04J*	ug/l
1,2,4-Trimethylbenzene	0.02J*	ug/l
1,2-Dibromo-3-chloropr+	1U	ug/l
1,2,3-Trichloropropane	1U	ug/l
Tert-Butylbenzene	1U	ug/l
Isopropylbenzene (Cume+	1U	ug/l
p-Isopropyltoluene	1U	ug/l
Ethylbenzene	1U	ug/l
BENZENE, ETHENYL-(STYR+	1U	ug/l
BENZENE, PROPYL-	1U	ug/l
Butylbenzene	0.02J*	ug/l
4-Chlorotoluene	1U	ug/l
1,4-Dichlorobenzene	1U	ug/l
1,2-Dibromoethane (EDB)	1U	ug/l
1,2-Dichloroethane	1U	ug/l
4-Methyl-2-Pentanone	1U	ug/l
1,3,5-Trimethylbenzene	0.01J*	ug/l

VOA - PP Scan (GCMS) *** Continued *** Blank #2	Water-Total Result	Units
Bromobenzene	1U	ug/l
Toluene	0.02J*	ug/l
Chlorobenzene	1U	ug/l
1,2,4-Trichlorobenzene	0.05J*	ug/l
Dibromochloromethane	1U	ug/l
Tetrachloroethene	1U	ug/l
Sec-Butylbenzene	0.01J*	ug/l
1,3-Dichloropropane	1U	ug/l
Cis-1,2-Dichloroethene	1U	ug/l
trans-1,2-Dichloroethe+	1U	ug/l
1,3-Dichlorobenzene	0.03J*	ug/l
1,1-Dichloropropene	1U	ug/l
2,2-Dichloropropane	1U	ug/l
2-Hexanone	1U	ug/l
Ethane, 1,1,1,2-Tetrac+	1U	ug/l
Total Xylenes	1U	ug/l
cis-1,3-Dichloropropene	1U	ug/l
trans-1,3-Dichloroprop+	1U	ug/l
p-Bromofluorobenzene	92	% Recov
Surrog: 1-Bromo-2-Fluo+	104	% Recov
d8-Toluene	91	% Recov
d4-1,2-Dichlorobenzene+	NAF	% Recov
1,2-Dichloroethane-d4 +	98	% Recov

(Sample Complete)

Project: HWD-127A RIDGEFIELD BRICK AND TILE Officer: MLB Account: AGDD3A

Blank ID: BW1101

VOA - PP Scan (GCMS) Blank #3	Water-Total Result	Units
Carbon Tetrachloride	0.5U	ug/l
Acetone	8 *	ug/l
Chloroform	0.5U	ug/l
Benzene	0.5U	ug/l
1,1,1-Trichloroethane	0.5U	ug/l
Bromomethane	0.5U	ug/l
Chloromethane	0.5U	ug/l
Dibromomethane	0.5U	ug/l
Bromochloromethane	0.5U	ug/l
Chloroethane	0.5U	ug/l
Vinyl Chloride	0.5U	ug/l
Methylene Chloride	2 *	ug/l
Carbon Disulfide	0.5U	ug/l
Bromoform	0.5U	ug/l
Bromodichloromethane	0.5U	ug/l
1,1-Dichloroethane	0.5U	ug/l
1,1-Dichloroethene	0.5U	ug/l
Trichlorofluoromethane	0.5U	ug/l
Methane, Dichlorodiflu+	0.5U	ug/l
1,2-Dichloropropane	0.5U	ug/l
2-Butanone	4 *	ug/l
1,1,2-Trichloroethane	0.5U	ug/l
Trichloroethene	0.5U	ug/l
ETHANE, 1,1,2,2-TETRAC+	0.5U	ug/l
1,2,3-Trichlorobenzene	0.3J*	ug/l
Hexachlorobutadiene	0.5U	ug/l
Naphthalene	0.4J*	ug/l
2-Chlorotoluene	0.5U	ug/l
1,2-Dichlorobenzene	0.5U	ug/l
1,2,4-Trimethylbenzene	0.5U	ug/l
1,2-Dibromo-3-chloropr+	0.5U	ug/l
1,2,3-Trichloropropane	0.5U	ug/l
Tert-Butylbenzene	0.5U	ug/l
Isopropylbenzene (Cume+	0.5U	ug/l
p-Isopropyltoluene	0.5U	ug/l
Ethylbenzene	0.5U	ug/l
BENZENE, ETHENYL-(STYR+	0.5U	ug/l
BENZENE, PROPYL-	0.5U	ug/l
Butylbenzene	0.5U	ug/l
4-Chlorotoluene	0.5U	ug/l
1,4-Dichlorobenzene	0.5U	ug/l
1,2-Dibromoethane (EDB)	0.5U	ug/l
1,2-Dichloroethane	0.5U	ug/l
4-Methyl-2-Pentanone	0.5U	ug/l
1,3,5-Trimethylbenzene	0.5U	ug/l

VOA - PP Scan (GCMS) *** Continued *** Blank #3	Water-Total Result	Units
Bromobenzene	0.5U	ug/l
Toluene	0.5U	ug/l
Chlorobenzene	0.5U	ug/l
1,2,4-Trichlorobenzene	0.3J*	ug/l
Dibromochloromethane	0.5U	ug/l
Tetrachloroethene	0.5U	ug/l
Sec-Butylbenzene	0.5U	ug/l
1,3-Dichloropropane	0.5U	ug/l
Cis-1,2-Dichloroethene	0.5U	ug/l
trans-1,2-Dichloroethe+	0.5U	ug/l
1,3-Dichlorobenzene	0.5U	ug/l
1,1-Dichloropropene	0.5U	ug/l
2,2-Dichloropropane	0.5U	ug/l
2-Hexanone	0.5U	ug/l
Ethane, 1,1,1,2-Tetrac+	0.5U	ug/l
Total Xylenes	0.5U	ug/l
cis-1,3-Dichloropropene	0.5U	ug/l
trans-1,3-Dichloroprop+	0.5U	ug/l
p-Bromofluorobenzene	98	% Recov
Surrog: 1-Bromo-2-Fluo+	91	% Recov
d8-Toluene	94	% Recov
d4-1,2-Dichlorobenzene+	NAF	% Recov
1,2-Dichloroethane-d4 +	98	% Recov

(Sample Complete)

Project: HWD-127A RIDGEFIELD BRICK AND TILE Officer: MLB Account: AGDD3A

Blank ID: PB 14.72

Metals - Specified Blank #1		Water-Total Result	Units
Arsenic	As-Total	1.5U	ug/l
Chromium	Cr-Total	0.2J*	ug/l

(Sample Complete)

Project: HWD-127A RIDGEFIELD BRICK AND TILE Officer: MLB Account: AGDD3A

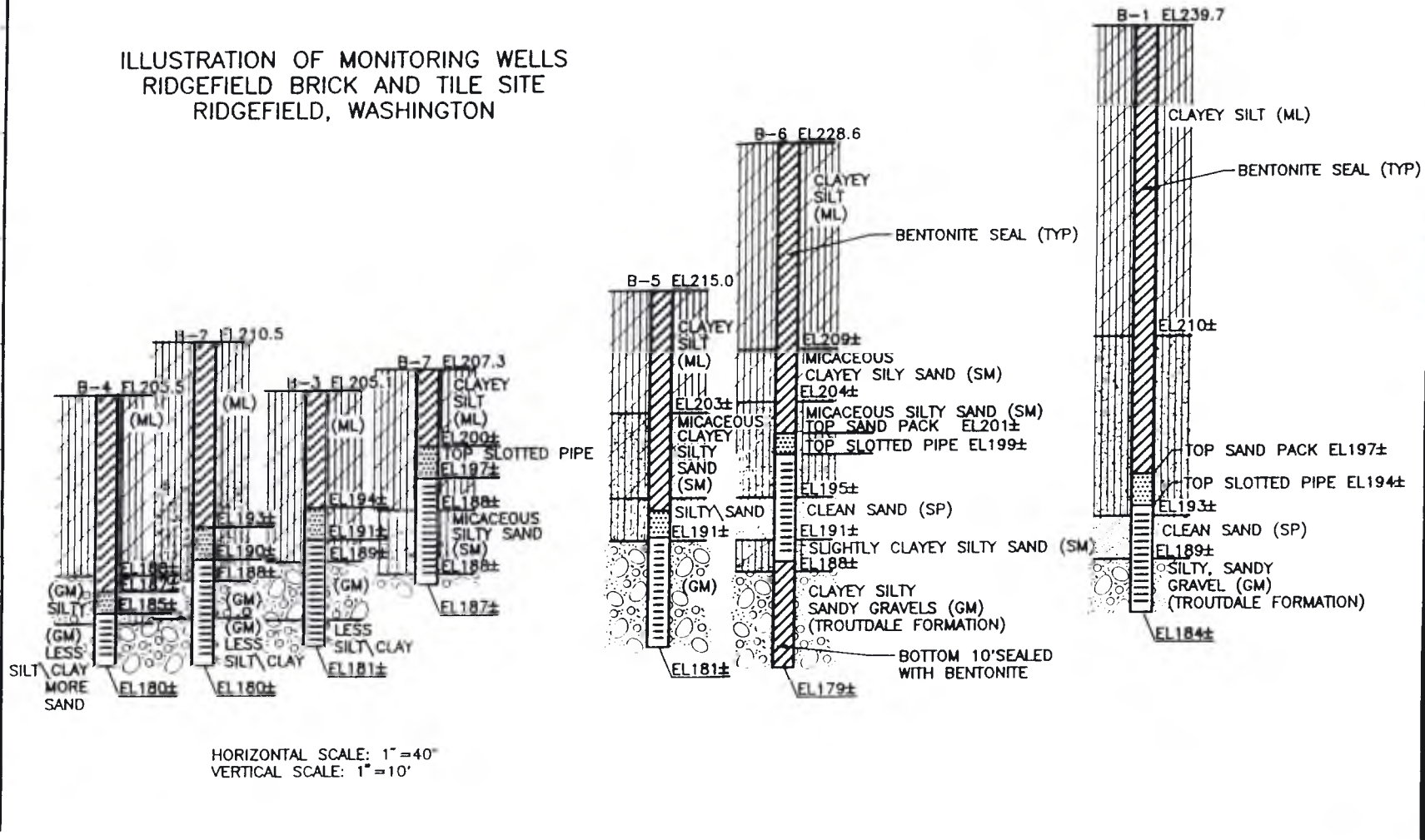
Blank ID: PB 16.97

Metals - Blank #1	Specified	Water-Filtere Result	Units
Arsenic	As-Diss	1.5U	ug/l
Chromium	Cr-Diss	2.0 *	ug/l

(Sample Complete)

APPENDIX G WELL CONSTRUCTION DIAGRAMS

ILLUSTRATION OF MONITORING WELLS
RIDGEFIELD BRICK AND TILE SITE
RIDGEFIELD, WASHINGTON



HORIZONTAL SCALE: 1"=40'
VERTICAL SCALE: 1"=10'

DESIGNED DATE
DRAWN DATE
CHECKED DATE

REVISIONS

DAVID J. NEWTON ASSOCIATES, INC.
CIVIL & GEOLOGICAL ENGINEERING
1201 SW 12TH AVENUE SUITE 620
PORTLAND, OR 97205
(503) 228-7718

SHEET NO.

PROJECT NO.